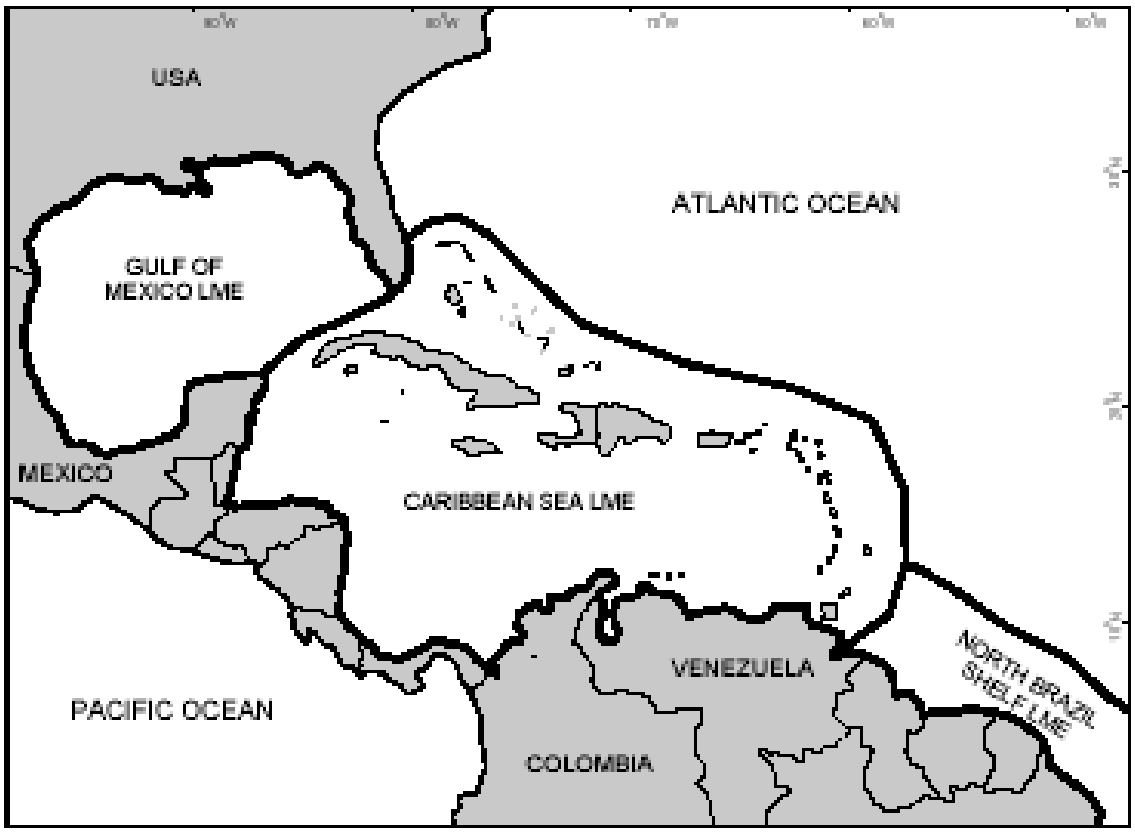
GOVERNANCE OF TRANSBOUNDARY FISHERIES RESOURCES IN THE WIDER CARIBBEAN

A discussion paper for the CLME Synthesis Workshop

by

Scott Parsons, Ph.D.



CLME Project Implementation Unit

Centre for Resource Management and Environmental Studies (CERMES)
University of the West Indies
Cave Hill Campus, Barbados

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1 Introduction

The present study focuses on the current arrangements and options for future arrangements for governance of transboundary fisheries resources in the Wider Caribbean. It was undertaken as a thematic study to provide background analysis for consideration of fisheries governance issues in the preparation of a Transboundary Diagnostic Analysis and development of a proposal for a Caribbean Large Marine Ecosystem (CLME) project for funding by the GEF/World Bank.

This study examines the characteristics of the Wider Caribbean (Fig.1), and identifies desirable components for governance of transboundary fisheries resources in this region. It reviews and assesses current arrangements for governance of transboundary fisheries resources and identifies gaps in organizational and institutional arrangements. It examines in some detail selected examples of governance of transboundary fisheries resources in other regions of the world, and suggests options for improved governance of such resources in the Wider Caribbean.

2 Methodology

The main source of information for this study, with respect to the Caribbean, was background documentation provided by, or identified by, various members of the CLME Task Team, supplemented by a literature search. In addition, various studies on regional fisheries governance elsewhere in the world were examined. The author also drew on his personal experience of several regional fisheries organizations, e.g. ICCAT, ICES, NAFO, NASCO and CECAF.

In addition, several individuals actively involved in Caribbean fisheries governance activities were consulted, both through in-person interviews and by correspondence.

3 Fisheries Governance

Humans have been attempting to manage fisheries in one form or another for more than a century. Indeed, some would argue that community management of fisheries existed in some societies long before the development of institutionalized management in the 20th century. In the second half of the 20th century formalized fisheries management approaches became increasingly prevalent in developed countries. International institutions (regional fisheries management organizations) were negotiated to deal with the problems created when distant water fishing nations (DWFNs) began to overexploit the living marine resources on the high seas(e.g. NEAFC, NAFO, NPAFC, and ICCAT). Declines in many major fish stocks by the late 1960s-early 1970s precipitated an extensive series of negotiations under the auspices of the United Nations, which led ultimately to the United Nations Convention on the Law of the Sea (UNCLOS 1982).

Prior to the formal agreement on UNCLOS, in the context of a developing consensus on the concept of the 200 miles exclusive economic zone, many coastal states proclaimed 200 miles exclusive economic zones or fishing zones from 1976-77 onward. Many of the zones overlapped , and this prompted the negotiation of bilateral and multilateral agreements to deal with these situations.

By the 1990s it was apparent that the world fisheries were under increased pressure and overfishing or overexploitation of fish stocks was common, both inside and outside the newly established 200 miles zones. The sustainability of marine living resources was under severe threat. Renewed activity on the international scene led to new initiatives -- the United Nations Highly Migratory and Straddling Fish Stocks Agreement of 1995(UNFA), the voluntary FAO Code of Conduct for Responsible Fisheries, the FAO Compliance Agreement, and International Plans of Action to address issues such as Illegal, Unregulated and Unreported Fisheries(IUU).

While this was occurring on the international scene, on the local scale there were increasing initiatives in many countries to introduce co -management and community arrangements with an emphasis on the involvement of small-scale fishers and artisanal fisheries. Numerous academic papers document this move to the local scale of management, e.g. Berkes et al (2001).

Over the past decade, the term "fisheries governance" has increasingly been used in place of "fisheries management." As Sissenwine and Mace (1999) observed, fisheries management and fisheries governance are commonly thought of as synonymous but governance is a broader term. A simple definition of governance is the system of "formal and/or informal rules, understandings, or norms that influence behavior." Young (1992) described governance as "the structure and processes by which societies share power." In this context, governance includes laws, regulations, institutions, negotiation, mediation, conflict resolution, elections, politics, consultation and other decision-making processes. Governance is not the sole purview of the state through Government, but rather emerges from many actors, including the private sector and not-for-profit organizations (Lebel et al 2000). Governance can be formally institutionalized or expressed through subtle forms of interaction or even more indirectly by influencing the agendas and shaping the contexts in which actors contest decisions, and determine access to resources.

In this sense, governance is frequently considered to have good attributes such as: participation, transparency, representation, deliberation, accountability, empowerment, social justice and organizational features such as being multilayered and polycentric (see Figure 2, adapted from Lebel et al. 2000).

Olsen et al. (2006) differentiate between governance and management as follows: “Governance probes the fundamental goals and the institutional processes and structures that are the basics for planning and decision-making. Management, in contrast, is the process by which humans and material resources are harnessed to achieve a known goal within a known institutional structure."

Recently, the " Fish for Life " project has developed a framework that places emphasis on "interactive fisheries governance." (Kooiman et al. 2005) They use the following definition of governance:

"Governance is the whole of public as well as private interactions taken to solve societal problems and create societal opportunities. It includes the formulation and application of principles guiding those interactions and care for institutions that enable them."

Their work emphasized the diversity, complexity and dynamics of both the natural and human systems involved in fisheries and argued that this makes them difficult to predict and

control. They also emphasized the need to involve the multiplicity of stakeholders in fisheries governance. They concluded:

"The only way to cope with complexity, diversity and dynamics, on the one hand, and with hard choices on the other, is through creating governance systems that are inclusive and adaptive through learning with a solid foundation of principles to help with navigation."

This paper examines the extent of transboundary fisheries governance challenges in the Caribbean and options for addressing these. The focus is on structures and institutions because the mandate was to examine transboundary issues, rather than issues at the national or local levels. Having examined what is meant by fisheries governance generally, we will now examine first, the Caribbean fisheries resources, their characteristics, and then examine selected arrangements for governance of transboundary fisheries resources elsewhere in the world, such arrangements in the Caribbean, any gaps, and options for improved governance of Caribbean transboundary fisheries resources.

4 Characteristics of fisheries resources in the Wider Caribbean

The Wider Caribbean extends from the Southeast coast of the United States to the Northeast coast of South America, including the Guianas and Brazil. Major subdivisions include the Gulf of Mexico and the Caribbean Sea, as well as the Southeast coast of the United States and the Northeast coast of South America. The region is geographically one of the most complex regions in the world. It is divided into a number of deep ocean basins, separated by shallow zones of a large number of offshore banks and the Continental shelf. The major island groups are the Bahamas and adjacent banks and Islands, which account for half of the Islands and bank shelf areas; the Greater Antilles (Cuba, Puerto Rico, the Virgin Islands, Hispaniola) and the lesser Antilles (Stevenson 1981). (Fig.1)

The area is characterized by clockwise flow of currents. The North Equatorial Current flows westward just north of the equator and meets with the Guina Current to form a Western Boundary Current. Where this Boundary Current enters the Western Central Atlantic, it splits into the Antilles and the Caribbean currents. The Antilles Current flows northwards on the Atlantic side of the Antilles Islands, eventually joining with the Florida Current. The remainder of the Western Boundary Current flows through the Eastern Caribbean, mainly between Barbados and Tobago, with most of the core of the north and westward flowing Caribbean Current and enters the Yucatán Channel. It then flows through the Yucatan Channel into the Gulf of Mexico, with flow clockwise through the Gulf and through the Straits of Florida to become the Florida Current. The Florida Current and the Antilles Current combine to form the Gulf Stream. The region also is under the influence of runoff from the major rivers discharging into the area: the Mississippi, Orinoco and Amazon rivers.

The geographic complexity of the region results in a very complex biodiversity, with at least 1172 species of invertebrates, fish and tetrapods occurring in the region. Of these, 987 are fish species and 23% of the fish are rare or endemic to the region. The Caribbean probably has the highest species richness in the Atlantic (Cochrane 2005, Smith et al 2002).

According to Cochrane (2005), nominal catches from the region increased from 500,000 tons in 1950 to a peak of 2.5 million tons in 1984. Catches subsequently declined but showed some increases in the 1990s to just under 2,000,000 tons in 1994 but have been stable between 1.5 and 1.7 million tons since then (Fig.3). A significant portion of the landings are unidentified even to group. The USA averaged over 900,000 tons per year in recent years.

Venezuela and Mexico also recorded landings in excess of 100,000 tons per year. The largest species group is herring, sardines and anchovies. It accounted for over 50% of the average annual landings between 2000 and 2003. This group is dominated by menhaden fished off the US coast.

Fishes from seven families dominated the small pelagic catches in the region. These are: flying fish, herring and sardines, anchovies and anchovetas; jacks, bumpers and scads; halfbeaks; needlefish and mullett. The group -- miscellaneous coastal fishes -- also makes an important contribution to the region's catches. This group includes a wide variety of species: sea catfishes, groupers, sea basses, grunts, sweet lips, snappers, jobfishes, croakers, and drums. The miscellaneous coastal fish can be subdivided into two broad groups based on habitat: those occupying areas with soft substrate and those typically occurring over reefs. There are also important fisheries for snapper on the Brazil-Guinas shelf fished both by local and foreign fleets.

The catches of the tunas, bonitos and billfishes group have increased over the last three decades, averaging 87,000 tons during the 1990s, compared with 52,000 tons in the 1970s. Venezuela accounted for nearly 30,000 tons per year, followed by Mexico and Taiwan. St. Vincent and the Grenadines recorded average landings of 49,000 tons per year during this period. The group is divided into two subgroups: the oceanic species, whose distribution extends beyond the Western Central Atlantic and the coastal large pelagics, whose distribution is largely confined to the Western Central Atlantic. Of the oceanic species, the largest catches are for yellowfin tuna with 30,000 tons landed in 2001. The coastal large pelagic catches are dominated by four species of *Scomberomorus*: king mackerel; Atlantic Spanish mackerel; serra Spanish mackerel and cero.

Crustacean fisheries are some of the most valuable in the Western Central Atlantic, in particular, fisheries for the Caribbean spiny lobster and those for a number of shrimp species. Landings of spiny lobster averaged around 30,000 tons during 2000 -- 2002. Spiny lobster is a high-value species. The Bahamas, Cuba, Nicaragua and the United States recorded highest landings.

We tend to think of large pelagics as shared resources. As Fanning et al (2007) note, however, reef organisms, lobster, conch, and small coastal pelagics may also be shared resources by virtue of planktonic larval dispersal. For many species, larval dispersal can last for many weeks (e.g., conch) or many months (e.g., lobster) and the young can be transported across EEZ boundaries. These early stages are affected by both habitat destruction and pollution as well as overfishing. Both improved knowledge and institutional arrangements are required for sustainable management.

4.1 Resource status

The United States National Marine Fisheries Service in its 2000 Report to Congress indicated that of the 57 stocks falling under the jurisdiction of the Gulf of Mexico Fisheries Management Council the status of 46 (81%) was either unknown or undefined. Of the 179 stocks falling under the jurisdiction of the US Caribbean Fisheries Management Council, the status of 175 (98%) was unknown or undefined. The state of knowledge is unlikely to be higher than this in the most other countries in the region.

The status of most species of small pelagics is largely unknown. The general understanding is that they vary from under - to - fully exploited (FAO 1998). Of the coastal demersal fishes, two grouper species are under rebuilding programs in the Gulf of Mexico and under the Caribbean Fisheries Management Council. The red snapper and the red drum remain under rebuilding programs for the Gulf of Mexico. In the US portion of the Gulf of Mexico, and in the coastal waters of Mexico, the red grouper is considered to be overexploited.

The latest estimates of the status of the groundfish stocks of the Brazil/Guinas shelf and French Guinea indicate that they are overexploited. According to FAO (1998) it is generally accepted that the inshore reef and groundfish resources are commonly fully exploited and some are overexploited. Mahon (1993) went further when he observed: "It is generally accepted that reef fish resources of the island platforms are extremely overexploited in most Lesser Antilles countries."

Some countries of the region are interested in expanding their fisheries for large pelagics. The oceanic large pelagics fall under the mandate of ICCAT. Yellowfin tuna is probably overexploited. Bigeye tuna is also considered to be overexploited as are bluefin tuna. With respect to coastal species, the status of Serra Spanish mackerel and Cero is unknown. The status of king mackerel is uncertain. Dolphinfish is considered to be overexploited.

The Caribbean spiny lobster is listed in Annex III of the Protocol Concerning Specially Protected Areas and Wildlife (the SPAW protocol) of the Cartagena Convention. Workshops held under the auspices of WECAF have concluded that in most countries there is an urgent need to control and/or reduce fishing effort in the lobster fisheries. Assessments of shrimp indicate that in most cases, the species/stocks are not being biologically overexploited, but are probably being fished above the economic optimum. However, some stocks, e.g. Gulf of Paria, are considered to be overexploited. Among molluscs, the Queen Conch is listed on CITES Appendix II and Annex II of the SPAW Protocol. International trade in the species is controlled by the national CITES authorities.

4.2 Special features of the Caribbean

The Caribbean Sea is the second-largest semi-enclosed sea in the world. The Wider Caribbean includes 26 countries and 19 dependent territories of 4 other countries. In the Caribbean Sea, a subset of the Wider Caribbean, there are 22 independent states and 11 island territories. There is a common dependence on two products -- fishing and tourism. The Caribbean states are very dependent on tourism, but fishing is also significant with 200,000 people employed as fishers and an additional 100,000 involved in the processing and marketing of fish. Assuming that each has five dependents, it has been estimated that more than 1.5 million people in the Caribbean area rely on commercial fishing for a livelihood (CARSEA In Press). Fishing is an even more important source of protein.

The Caribbean is characterized by the lack of a unified political authority and a complex geopolitical composition. There are a series of overlapping regional authorities. This constitutes a significant barrier to holistic regional marine fisheries governance.

The small island developing states (SIDS) have a particularly high stake in marine fisheries management, as their ratio of marine to land area or population is significantly higher than for mainland states (Mahon 1996a). Although the Western Central Atlantic does not support any of the world's major fisheries and contributes less than 2% of world fisheries landings, the fisheries are very important to the countries involved. For the Western Central Atlantic

landings are in the order of 2 million tons per year. According to new analyses conducted for CARSEA (CARSEA 2007), fish landings from just the Caribbean Sea increased from about 85,000 tons in 1950 to around 500,000 tons in 1998 and subsequently declined to around 400,000 tons by 2004 (Fig 4). The catch is dominated by the artisanal sardine fishery based in Venezuela. Sardines, catfish, shrimp and lobsters contribute most to the landed value.

Mahon (2002) examined in detail the status of the marine living resources of the Caribbean. Space precludes a full treatment here. He summarized the relative importance of various fisheries to Caribbean countries and their state of exploitation (Table 1). This is useful background for subsequent discussion of possible options for improved governance of transboundary fisheries resources.

4.3 Nature of the fisheries sector

Harvesting of fisheries resources in Caribbean countries is primarily artisanal, or small-scale, using open outboard powered vessels 5-- 12 m in length. Exceptions include the shrimp and groundfish fisheries of Guyana and Suriname, where trawlers in the 20-30 meters range are used and the tuna fishery of Venezuela which uses large (> 20 m) long liners and purse seiners. In some countries there has been a recent trend towards midsize vessels in the 12-15 meter range, particularly for large pelagics, deep slope fishes and lobster and conch on the offshore banks (Mahon 2002).Many fishers are part-time and make their living from variety of activities besides fishing, especially where fish resources are seasonal.

5 Current arrangements for transboundary fisheries governance in the Wider Caribbean

The sheer variety of fish and invertebrates occurring in the Caribbean and the lack of adequate (or complete absence) of data for most species/stocks, combined with the transboundary nature of most species, pose major obstacles to effective transboundary fisheries governance. This is further compounded by the geopolitics of the region and the Spanish/English cultural divide.

Over time some organizations have evolved to deal with certain aspects of fisheries governance in this region. These include the Western Central Atlantic Fisheries Commission of the FAO (WECAFC), CARICOM and its Caribbean regional fisheries mechanism (CRFM), and OSPESCA which covers Central American countries. On a more general international level, the International Commission for the Conservation of Atlantic Tunas (ICCAT) Atlantic-wide mandate includes large pelagics in the Caribbean. There are a variety of other economic coordination/governance mechanisms for the wider Caribbean but the ones mentioned above are the ones with a specific interest in fisheries. In addition to the above fishery focused organizations there are a number of intergovernmental agencies such as OECS, CARIFORUM and the ACS with a broad multi-sectoral mandate for sustainable development.

5.1 WECAFC

The Western Central Atlantic Fishery Commission is a regional fisheries body established under Article VI of the FAO Constitution. The Commission's area of competence is defined as all waters of the Western Central Atlantic, encompassing the waters off the Southeast coast of the United States, the Gulf of Mexico, the Caribbean Sea and waters off the Northeast coast of South America, including part of Brazil.

The Commission's mandate includes all living marine resources. The goal of the commission is to promote international cooperation for the conservation, development and sustainable utilization of the living marine resources of the WECAF area. The main objectives are to facilitate the coordination of research, to encourage education and training, to assist member governments in establishing rational policies and to promote rational management of resources that are of interest to two or more countries. The Commission is not actively involved in fisheries management/governance in the region. Responsibility for fisheries government is left to the member countries. WECAF provides scientific information and can provide advice upon which governance can be based. The Commission does not have any regulatory powers and functions only in advisory capacity.

The membership of WECAF is open to all member nations and associate members of FAO. The present members of the commission are: Antigua, Bahamas, Barbados, Belize, Brazil, Columbia, Costa Rica, Cuba, Dominica, European Union, France, Grenada, Guatemala, Guinea, Guyana, Haiti, Honduras, Jamaica, Japan, Korea, Mexico, Netherlands, Nicaragua, Panama, St. Christopher and Nevis, St. Lucia St. Vincent and the Grenadines, Spain, Suriname, Trinidad and tobacco, United Kingdom, United States of America, and Venezuela.

Typically WECAF's work program is implemented through ad hoc working groups based on geography/ecosystem (e.g. WECAF Working Group on Shrimp and Groundfish Fisheries in the Brazil/Guinas shelf) or on species (e.g. WECAF Ad Hoc Working Group on Spiny Lobster .) These working groups have specific terms of reference and are time-bound. The Commission and its subsidiary bodies are financed and administered by FAO.

The Commission has two subsidiary bodies:

- Committee for the development and management of fisheries in the Lesser Antilles
- The Scientific Advisory Group (SAG)

The SAG acts as an advisory body to the Commission and its ad hoc working groups.

That WECAF serves an important coordinating role is exemplified by the large number of workshops it has sponsored and reports it has produced over the past five years. But clearly lacking is the mandate to act as a regional fisheries management organization with regulatory/management functions. This is discussed further under options for future governance.

5.2 CARICOM/CRFM

Chakalall et al (1998) identified issues in fisheries governance confronting the Caribbean community (CARICOM). Haughton et al (2004) described how CARICOM is addressing these challenges through the establishment of the Caribbean Regional Fisheries Mechanism (CRFM), a regional fisheries body to facilitate closer cooperation for the sustainable development and conservation of the fisheries resources of the CARICOM countries.

The Caribbean Community and Common Market or CARICOM was established by the Treaty of Chaguaramas effective August 1973. A revised treaty of Chaguaramas establishing the Caribbean Community including the CARICOM Single Market and Economy (CSME) was signed in July 2001.

CARICOM replaced the Caribbean free trade association that had been organized to provide a continued economic linkage between the English-speaking countries of the Caribbean. Although initially a grouping of former British colonies, CARICOM has officially become multilingual in practice with the addition of Dutch-speaking Suriname in 1995, and Haiti, where French and Creole are spoken, in 2002. Currently CARICOM has 15 full members: Antigua and Barbuda, the Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, St. Kitts and Nevis, St. Lucia, St. Vincent and Grenadines, Suriname and Trinidad and Tobago.

As Haughton et al (2004) described, CARICOM countries realized as early as 1996 that they needed to respond to the common management challenges they face on the basis of more or less complete ecological zones, taking into account the natural boundaries of the fish stocks and associated ecosystems. The major fishery ecosystems are usually not contained within the individual EEZs of CARICOM's states but rather span their maritime boundaries. Due to the prevalence of common shelf areas that span the EEZs of countries, the most abundant fisheries resources in the Caribbean are shared stocks. CRFM had its genesis in the collaborative effort between CARICOM and Canada beginning in 1991, which launched the CARICOM fisheries resource assessment and management program (CFRAMP) to promote sustainable use and conservation of the fisheries resources of CARICOM member states. Work began in 1996 to define and establish a Caribbean Regional Fisheries Mechanism (CRFM) as a permanent and sustainable successor to CFRAMP. CRFM was formerly established by intergovernmental agreement in February 2002.

The overall goal of the CRFM is "to promote sustainable use of fisheries and aquaculture resources in and among member states by the development, management and conservation of these resources in collaboration with stakeholders to benefit the people of the Caribbean region." Three specific objectives were established for the CRFM: (1) the efficient management and sustainable development of marine and other aquatic resources within the jurisdiction of member states; (2) the promotion and establishment of cooperative arrangements among interested states for the efficient management of shared, straddling or highly migratory marine and other aquatic resources; and (3) the provision of technical advisory and consultative services to fisheries divisions of member states in the development, management and conservation of their marine and other aquatic resources.

Membership in the CRFM is open to all CARICOM member states and associate member states. Beyond this, the ministerial council may admit as an associate member of the CRFM any State or territory of the Caribbean region that, in its opinion, is able and willing to discharge its obligations under the intergovernmental agreement. The core structure of the CFRM consists of three main components: the Ministerial Council, the Caribbean Forum, and the CRFM Secretariat. The interrelationship among these components and with stakeholders is depicted in Fig. 5. The establishment of the CRFM obviously represents a positive step forward on the path to sustainable fisheries within the Caribbean region. Haughton et al (2004) noted that it was considered more prudent to start with a small group of countries that had a history of collaboration than with a larger group with less cohesion.

Now that CARICOM has embraced the concept of the Caribbean Single Market Economy, the next step in the evolution of CARICOM's approach to shared fisheries is occurring. Negotiations are under way on the development of a common fisheries policy for CARICOM, analogous in some ways to the European Union's well-known Common Fisheries Policy. A draft treaty is under discussion. The potential implications of this for CRFM are discussed by Cruickshank et al (2004). Assuming that this initiative is brought to

fruition within the foreseeable future, it will represent concrete progress toward sustainable use of the shared fisheries resources of the CARICOM countries. Of course, CARICOM only encompasses a portion of the states and territories in and bordering the Caribbean. So, by itself, it cannot achieve the level of regional fisheries governance that, at least in theory, seems desirable.

5.3 OSPESCA

Another organization involved in addressing shared fisheries management challenges in the Caribbean is OSPESCA. OSPESCA, established in 1995, is the organization for the fishing and aquaculture sector of the Central America Isthmus. It has seven participating countries: Belize, Costa Rica, El Salvador, Guatemala, Honduras, Niaragua, and Panama.

OSPESCA is structured as follows:

- Ministers Council -- political level
- Vice Ministers council -- executive level
- Directors Commission -- technical and scientific level

In December 1999 OSPESCA became part of the General Secretariat of the Central American integration system (SG-SICA). In 2000 the SG-SICA created the regional fishing and aquaculture unit (the SICA/OSPESCA unit).

OSPESCA has been involved in promoting harmonization and modernization of legislation pertaining to fisheries. Five countries already have updated laws --Belize, Costa Rica, El Salvador, Guatemala, Nicaragua -- and updating is under way in Honduras and Panama. SICA/OSPESCA is also pursuing harmonized fisheries management measures for shared resources including: shrimp, lobsters, Queen Conch and tunas.

In fact, OSPESCA has gone further than that and adopted, in 2005, a Fisheries and Aquaculture Integration Policy for the Central American Isthmus (Sergio Martinez, personal communication). This policy incorporates the following principles: sustainability, precaution, Central American integration, regional responsibility, citizenship participation, intraregional solidarity, and good neighbours. The policy places emphasis on the need to strengthen organizations of fishers and users of the resource. It encourages collaborative research, harmonized closed seasons, use of similar fishing gears and joint management of shared areas, the consideration of global annual quotas and the numbers of vessels recommended for the appropriate use of the fisheries resources. The policy also identifies as a priority the formulation and implementation of action plans under the framework of the Code of Conduct for Responsible Fisheries, specifically: the International Plan of Action to Reduce the Incidental Capture of Marine Birds in the Longline Fishery; the International Plan of Action to Prevent and Discourage Illegal, Unreported and Unregulated Fishing; the International Plan of Action for the Management of Fishing Capacity; and the International Plan of Action for the Conservation and Management of Sharks.

While implementation of the 2005 policy is still in progress, it is encouraging to see the commitment of the countries of the Central American Isthmus to tangible collaboration in management of their shared fisheries resources.

5.4 ICCAT

There is another international fisheries management organization whose mandate includes tunas in the Caribbean. The International Commission for the Conservation of Atlantic Tunas (ICCAT) was established in the late 1960s. Its area of competence includes all waters of the Atlantic Ocean, including the adjacent seas such as the Mediterranean and the Caribbean. The Commission's responsibilities extend to populations of tuna and tuna-like fishes, as stipulated in Article IV, (the Scombriformes with the exception of the families Trichiuridae and Gemplidae and the genus Scomber) and "such other species of fish, exploited in tuna fishing in the convention area, as are not under investigation by another international fishery organization."

The large pelagic fishes of the WECAF fishing area are traditionally divided into "offshore species with oceanic distribution" and "coastal with a regional distribution", e.g. Mahon (1996b). The first group includes the highly migratory billfishes, tunas and swordfish species and the second group includes the mackerels, blackfin tuna, Bonito and common dolphin species.

While the oceanic pelagic species may hold the greatest potential for the expansion of fisheries, the coastal pelagic species provide most of the present yield, particularly dolphin fish (Singh-Renton et al, 2003). Fisheries on large pelagics have expanded considerably in recent years in several countries of the WECAF area. Grenada, St. Lucia and Barbados have all expanded their fishing effort on these species and Guyana and Suriname have expressed interest in developing fisheries for large pelagics. Similar trends have been observed in the non-CARICOM countries of the Caribbean as well. CARICOM has participated in selected ICCAT activities as an observer since 1991. Recent ICCAT assessments have shown clear evidence of overexploitation of several major Atlantic tunas stocks (Singh-Renton et al, 2003). Although coastal species also fall under the auspices of ICCAT, they have received little attention by ICCAT.

Currently there are 43 contracting parties to ICCAT. Membership from the Caribbean region has grown substantially since 1998. Venezuela has been a member since 1983. Panama joined in 1998, Trinidad and Tobago 1999, Barbados 2000, Honduras 2001, Mexico 2002, Niaragua 2004, Guatemala 2004, Belize 2005 and St. Vincent and Grenadines 2006. In addition, the UK and France remain members on behalf of their overseas territories.

ICCAT applies a wide range of management measures in an attempt to prevent overfishing of major Atlantic tunas stocks. ICCAT regulations include Total Allowable Catches, minimum size restrictions, and general effort limitations. The increasing use of TACs and catch quota allocation among contracting parties has contributed to the surge in membership, as countries jockey for shares of the allowable catches.

Traditionally ICCAT allocated TACs and national allocations based solely on historical catches. Certain countries pushed for review of catch allocation criteria in order to recognize the needs of developing fisheries, developing states and the sovereign rights of coastal states. To address these concerns, in 1998 ICCAT established an Ad Hoc Working Group on Allocation Criteria. For discussion of the allocation criteria and their implications for Caribbean states, see Singh-Renton et al (2003).

At the request of some Caribbean states, the FAO approved the Technical Cooperation Program (TCP) (project TCP/PLA 10070), Preparation for Expansion of Domestic Fisheries for Large Pelagic Species by CARICOM countries. This project commenced in 2001 and

ended in 2003. The results are reported in FAO Fisheries Technical Paper 464 (Mahon, R., and P. McConney, P. 2004 (Ed)). Among other matters this paper addresses options for improved governance of large pelagics in the Caribbean context.

While there has been input from some Caribbean countries to the current ICCAT structure and measures, these existing arrangements are inadequate to address the interests and needs of Caribbean states in the fisheries for large pelagics, oceanic and coastal. For discussion of options for improved governance arrangements, see section VIII.

6 Gaps in organizational and institutional arrangements

It is clear from the preceding section that current arrangements for governance of transboundary fisheries resources in the wider Caribbean are inadequate. Apart from the developing initiatives under CARICOM/CRFM and OSPESCA, there is little focus on joint management of shared stocks. WECAF provides an umbrella arrangement for coordinating scientific assessments and information exchange but lacks a management/governance mandate. ICCAT has a mandate for tunas and tuna like species but this is only being exercised for the major tuna species on an Atlantic wide basis. There is no appropriate mechanism to provide coordinated management of the coastal large pelagics, whose distribution occurs primarily in the Wider Caribbean.

Statistical information on the quantities and species of fish being caught in Caribbean fisheries is poor. Large quantities of the landings are not identified by species, and there is doubt about the accuracy of reported landing quantities. Scientific assessment of the status of Caribbean fisheries resources is inadequate, at best. There are some efforts through WECAF and CRFM to address the deficiency, particularly through ad hoc working groups and workshops to assess particular species or the resources in particular regions. Each year CRFM convenes a regular scientific meeting which reviews the status of stocks and undertakes scientific assessments. These workshops normally run two weeks and involve scientists from all CRFM states plus regional institutions like the University of the West Indies, international organizations like FAO and some selected experts from across the globe in the subject matter under consideration. The assessments/reviews are usually conducted on species or groups of similar species (e.g. lobsters and Queen Conch, large pelagic coastal species, shrimp and groundfish). The reports of the working groups are then discussed in a plenary scientific meeting for general discussion of the findings and refinement of the recommendations. (Milton Haughton, personal communication) This scientific process conducted by CRFM is valuable but of course it only covers fisheries resources under the auspices of the CRFM. This means there are large gaps/areas where resources are not adequately assessed except where WECAF fills the void.

In addition to the science-related activities of regional/sub-regional organizations mentioned above, stock assessment and related science are also being undertaken by some national institutions. There is a need to make better use of existing information and to share it from highly centralized points, e.g. USA, Mexico, Cuba and Venezuela, to other countries through regional initiatives. While overall the lack of adequate stock assessment is a real gap, some small-scale resources yield too little return to warrant a standard stock assessment. In such instances, other approaches to management are needed, as suggested by Mahon (1997).

There is also an equally large gap with respect to the assessment and understanding of fisheries systems in general. This includes the need for social and economic analysis of fishing and marketing, valuation of fisheries, etc. As pointed out earlier, there is also a need

to take ecosystem considerations into account in fisheries management. Addressing this will require more attention to and studies on the ecosystem aspects of fisheries.

Various authors have noted that fisheries administrations in Caribbean countries vary widely in levels of staffing and expertise. Chakalall *et al* (1997) observed: "They often lack the technical and support staff required to administer and manage their respective fisheries and act as counterparts for projects financed and partially staffed by external agencies. Small fisheries administrations will seldom have all the expertise or numbers of staff to address all areas of fisheries administration, research, management and development."

Another gap at the national level is the lack of well-developed interdepartmental linkages in fisheries and integrated coastal zone management. Recognizing that the value of the resources is often limited in relation to the potential costs of science and management, Chakallall *et al* (1997) argued that fisheries administrative schemes should be guided by the value of the resource, in particular:

"In the circumstances fishery managers should explore management approaches which are less demanding of data and expertise and which rely to a greater extent on management reference points based on agreement among stakeholders, the precautionary principle and the guidelines for responsible fishing."

With respect to stakeholder participation, it should be noted that fisherfolk organizations in many Caribbean countries are relatively weak, and in some countries do not exist at all. This poses serious structural and operational constraints to their involvement in fisheries governance at any level. For further consideration of this matter, see the companion thematic report on stakeholder involvement.

Another deficiency is the lack of resources/human financial and vessels to perform adequate monitoring, control and surveillance. Many countries lack the capability for effective enforcement of fisheries regulations. One complication is that widely scattered, small-scale, world fisheries are particularly difficult to monitor. There are powerful incentives for fishers to ignore regulations. Seagoing capability to curtail illegal fishing is minimal in most small or less-developed Caribbean countries. There is potential for reasonable regional collaboration in MCS activities. Indeed, OSPESCA has undertaken initiatives in this respect for countries of the Central American Isthmus (Sergio Martinez, personal communication).

A final point is that the existing fisheries governance arrangements do not take account of broader ecosystem considerations and hence impede progress towards a more holistic ecosystem-based approach that is needed to fully address broader governance challenges and achieve full benefits from the Caribbean marine ecosystem.

7 Desirable components of governance of transboundary fisheries resources in the Wider Caribbean

Given the inadequacies of the fragmented, under-resourced and piecemeal mechanisms currently in place for governance of transboundary fisheries resources in the Caribbean, what are some desirable components of an improved governance framework? From the evidence gathered in this study, the following appear to be key components of an improved governance framework:

- **Comprehensive**

Current arrangements are fragmented. Any new governance mechanisms should be comprehensive while allowing for scale-conscious and scale-appropriate sub-mechanisms.

- **Transparency**

Any new mechanism should be clearly articulated and easily explainable to participants.

- **Accountability**

There should be clear lines of accountability from stakeholders at the national level and national governments through to the intergovernmental mechanisms, with provisions for feedback. Decision-making procedures should be clearly articulated.

- **Participatory**

There should be appropriate mechanisms for stakeholder involvement from the national level to the intergovernmental mechanisms.

- **Equitable**

Equity will be a key issue for those considering whether to participate. Provisions for decision-making, voting and allocation criteria need to be structured to provide for equity, both real and perceived.

- **Sustainability**

Sustainability of aquatic living resources should be the chief goal. Without conservation of the resource base, sustainable use is not possible. In this connection, the arrangements should be consistent with and fully take into account the principles and provisions of the major multilateral agreements such as the Law of the Sea, the United Nations Fish Stocks Agreement, the Convention on Biological Diversity and the Cartagena convention.

- **Precautionary approach**

The precautionary approach (err on the side of caution) should be incorporated as one of the key principles of any new arrangement. This is particularly relevant for the Caribbean situation where the poor state of information on catches and the status of stocks make it doubly important that the decisions taken be cautious. The poorer the information base, the greater the need for caution.

- **Adaptive**

Management needs to be adaptive. There should be clear scope for learning by doing and for testing of concepts through pilot projects, where appropriate.

- **Efficient**

Any new arrangement should be built on the principle of "maximum bang for the buck." In other words, the structure should be streamlined, to the extent possible, bearing in mind the tremendous diversity of fisheries and cultures in the Caribbean, and transaction costs should be as low as feasible.

- **Best use of expertise**

The arrangement should function in such a manner as to tap into expertise effectively, no matter where located in the Caribbean.

- **Resource scale and diversity**

Taking into account resource scale and diversity throughout the Caribbean, any new arrangement should include provisions for sub-structures that allow decisions to be taken by those with the greatest interest in, and knowledge of, particular fisheries resources (geography/species).

- **Ecosystem Approach**

Any new governance arrangement should make clear provisions for taking ecosystem considerations into account in fisheries management (Parsons 2005a).

8 Options for improved governance of transboundary fisheries resources

Based on the available evidence it appears that major change is required in the arrangements for governance of transboundary fisheries resources in the Wider Caribbean. Chakalall et al (in press) summarized the problems with the existing fisheries management arrangements thus:

"Essentially the array of organizations with interest in fisheries management is a mix of political and technical entities at a variety of geographic scales with affiliations at a variety of organizational scales. These arrangements were not originally oriented towards regional level cooperation in governance. However, they do provide some basis for achieving it. Their current weaknesses are often scale related; their geographic scope is inadequate; their small size is limiting; the capacity is limited, often comprising only a small Secretariat, and is often further diluted by a wide range of responsibilities. Equally problematic is that a value system (tradition/culture) for cooperation and integration is lacking."

It is clear that the current fragmented approach to governance of transboundary living marine resources in the Wider Caribbean is inadequate and ineffective. Institutional change is required. More effective regional governance requires new or modified institutions and processes. Under Article 63 of the 1995 UN Fish Stocks Agreement, shared and straddling stocks are treated together. In both cases, the States concerned, whether coastal or distant water fishing nations, should seek: *"either directly or through appropriate regional or subregional organizations"*, to agree upon the measures necessary for their conservation and development.

First, I will address the issue of improved governance for the large pelagics and then the more general issue of achieving more effective regional governance for other species.

8.1 Large Pelagics

As described earlier, ICCAT has the mandate with respect to large pelagics (tunas and tuna-like species) Atlantic-wide, including the Caribbean. In the Mediterranean, the GFCM has a

joint working group with ICCAT to address management of bluefin tuna, in particular, in the Mediterranean. In January 2007 the GFCM agreed to adopt the recovery plan and package of conservation measures for bluefin tuna adopted by ICCAT at its November 2006 meeting.

FAO (2004) addressed in detail the management of large pelagic fisheries in CARICOM countries. The large pelagics are usually subdivided into oceanic and coastal groupings. For oceanic species, the FAO project investigated the need for and modes of direct involvement in ICCAT. For coastal species, the project identified the need for a regional arrangement. This could be a subsidiary of ICCAT, or a separate entity with close collaboration if ICCAT is willing to delegate its responsibilities for coastal species .The FAO study suggested that the CRFM could play a key role in both aspects. For oceanic species, it could coordinate and provide technical support for member country participation in ICCAT. For coastal species, the CRFM could take the lead in establishing a regional arrangement for the species, working with CARICOM members, other regional fishing countries and distant water fishing nations.

Sing-Renton and Haughton (2004) suggest two alternatives for such a regional arrangement. One would be to establish an RFMO to coordinate statistics, research and management of coastal large pelagic resources occurring within the Caribbean. An alternative would be to establish, perhaps as an interim measure, a Regional Working Group to coordinate research and assessments of the stocks concerned at the regional level. If this approach were pursued, a CRFM or WECAF Working Group may serve the purpose. They suggested that the RWG should report either directly to the ICCAT Small Tunas Working Group or to the ICCAT Scientific Committee on Research and Statistics. It would be up to ICCAT to decide on proposed management measures.

8.2 More Effective Regional Governance

Chakalall et al (In Press) suggest three possible alternatives for improving governance of transboundary fisheries. Their suggestions are:

- A Coordinated Network
- A Single RFMO with Departments
- An All-inclusive RFMO

Each of these options has pros and cons. Following are some comments on these alternatives.

- **Coordinated network**

This concept envisages governance being achieved through a network of formal and informal multilateral agreements for the various resources/regions of interest to particular countries. The network would seek to establish common principles and practices where appropriate. Compliance with these principles/practices would be voluntary.

The major shortcoming of this approach is that it assumes a strong will to maintain voluntary agreements even perhaps in the face of sporadic funding arrangements. The second problem is that it is difficult to see regional decision-making being achieved under such an informal network arrangement. Given the current overfished status of many Caribbean fisheries resources, timely action is required to ensure the sustainable resource base for the future.

- **An All-inclusive RFMO**

This terminology refers to a single unitary standard RFMO with a Secretariat that would oversee the management cycle for the wide variety of marine resources throughout the Caribbean region. As we have seen in the discussion on RFMOs around the world, the normal mode of operation is to apply one process to all resources with all countries involved in the assessments and decision-making for all resources. One advantage is that it makes the maximum use of combined scientific/technical expertise. Some have suggested that it provides for the maximum dominance by larger countries. Assuming one vote per country, I fail to see why this would necessarily be the case, apart from the normal tendency for larger, wealthier countries to pressure or offer incentives for support to their smaller neighbours.

- **Single RFMO with Departments**

Under this option, there would be one overall RFMO but with department/panels for various subsets of regions or resources. This would allow for different arrangements to be implemented for different species groups or regions. In essence, these department/panels could be semiautonomous entities operating under the umbrella of the overall RFMO. One major advantage of such an arrangement would be flexibility within an overall framework of principles and practices. The flexibility could extend to financing arrangements, with the countries being able to opt in or out of the sub mechanisms depending on their interest in and the perceived benefit of participating in the various components. Department/panels could be assigned in such a way as to best address issues of geography, ecosystem, resource type and expertise available.

There are some fisheries in the Caribbean which could perhaps sustain a self-contained management organization, e.g. the Guinas- Brazil region, where a high-value resource is geographically concentrated and shared by a few countries. Many transboundary resources are, however, harvested by small-scale fisheries. This presents a special challenge. Small-scale fisheries harvest a wide variety of resources from the demersal resources, which have a transboundary component during early life history, to large pelagics that migrate throughout the region.

There is a compelling case for a region-wide governance organization (RFMO) with sub-mechanisms tailored to meet the needs of geography, resources and participants. Designing and implementing such a regional approach will not be a simple task. One of the major challenges will be to bridge cultural/historical divides. Another will be to find an appropriate formula for funding such an arrangement, given the economic disparity between some of the lesser-developed island states and the larger, wealthier countries of the region. It is clear that the current system is not sustainable. It is also clear that the Caribbean is a unique semi-enclosed sea with a high density of independent small states, and hence requires a special solution tailored to the special characteristics of the Wider Caribbean. Designing and implementing such a new regional governance mechanism will take a great deal of time, effort and expertise and political will.

It may well be necessary to pursue this in a step-wise manner, using a coordinated network approach and pilot projects to set the stage for an eventual fundamental change in regional governance.

9 Transboundary fisheries governance arrangements in other regions of the world

9.1 General

Space precludes an in-depth examination of fisheries governance arrangements for transboundary fisheries resources in other regions of the world. Brief descriptions are provided of arrangements in the North Atlantic and the North and South Pacific and for tunas world-wide. More attention will be given to two other semi-enclosed seas -the Baltic Sea and the Mediterranean. [1]

Sydnes (2001a) provides a conceptual discussion of regional fishery organizations and identifies three types of such organizations. As mentioned earlier, global fisheries has emerged as a major issue on the international environmental agenda over the past 15 years. This has stimulated the development of a number of international instruments pertaining to the sustainable management of living marine resources. Among these are Chapter 17 of Agenda 21, adopted by the 1992 United Nations Conference on Environment and Development, the 1993 FAO Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas, the 1995 United Nations Agreement on the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (UN Fish Stocks Agreement), and the 1995 FAO Code of Conduct for Responsible Fisheries. All of these agreements place special emphasis on regional fisheries organizations as being "vehicles of good governance " for the management of international fisheries. It is worth noting that regions are increasingly viewed as the appropriate level to cooperate on fisheries issues that cannot be appropriately addressed at the global or national levels.

The term "regional fisheries organization" describes international organizations with regional scope, performing scientific, coordinating, or management-oriented functions related to fisheries. RFOs are usually created in response to specific problems related to regional fisheries. RFOs are intergovernmental organizations, i.e. the members are sovereign states. Some RFOs allow for the membership of "regional economic integration organizations", a terminology developed to recognize the role of the European Union (EU) and its competence for fisheries policy and management on behalf of its member states (Sydnes 2001a).

Sydnes (2001a) identified 24 RFOs for the purpose of his study. Swan (2004) mentioned more than 30. She used the terminology regional fisheries body (RFBs). Three main categories of RFOs or RFBs exist: scientific research organizations, regional coordination and development organizations, and regional fisheries management organizations. The International Council for the Exploration of the Sea (ICES), initiated in 1902, was established as a scientific research organization with the mandate to promote and encourage marine research, draw up and organize international marine research programs, and publish and disseminate the results of its activities (Parsons 2002). The Forum Fisheries Agency (FFA) in the South Pacific, on the other hand, is a regional coordination and development organization mandated to promote intraregional cooperation and coordination regarding the harmonization of fisheries management policies relations to DWFNs, surveillance and enforcement, fish processing and marketing, and access to each other's EEZs. The Northwest Atlantic Fisheries Organization (NAFO) was established in 1998, as the successor to ICNAF,

[1] A more detailed treatment of this subject is available from the author on request.

to function as a regional fisheries management organization for straddling fish stocks and stocks occurring beyond 200 miles in the Northwest Atlantic (Parsons and Beckett 1998).

As Swan (2004) notes, the establishment of 200 miles EEZs and the 1982 UNCLOS prompted existing RFOs to review and amend their conventions and subsequently led to the establishment of new organizations with more modern mandates. Of the current more than 30 RFOs, almost half have been established since the Law of the Sea convention was adopted. The rest of this discussion focuses on regional fisheries management organizations (RFMOs) established to manage fisheries resources in the traditional sense. The UN Fish Stocks Agreement of 1995 is the most comprehensive of the international instruments in defining the role of regional fisheries management organizations. Even before entry into force of this agreement, provisions of the agreement had been widely used as a benchmark for state practice.

Article 10 of the Fish Stocks Agreement sets out an extensive list of RFMO functions (see Appendix I). Chief among these is that states must agree on and comply with conservation and management measures to ensure the long-term sustainability of fish stocks. States are also charged with agreeing on participatory rights such as allocation of allowable catch or levels of fishing effort. With this background established, we will now examine selected examples from other regions of arrangements for governance of transboundary fisheries resources.

9.2 North Atlantic

Excluding adjacent seas (the Baltic and the Mediterranean) and organizations with a trans-Atlantic or transoceanic mandate (ICCAT and IWC), there are three fisheries management organizations specific to the North Atlantic -- NEAFC, NAFO and NASCO.

The Northeast Atlantic Fisheries Commission (NEAFC) is the RFMO for the Northeast Atlantic. Most of the convention area is under the fisheries jurisdiction of NEAFC's contracting parties but three large areas are international waters and constitute the NEAFC Regulatory Area. The members are Denmark (in respect of the Faroe Islands and Greenland), the European Union, Iceland, Norway and the Russian Federation. NEAFC manages fisheries in the Regulatory Area. NEAFC receives its scientific advice from ICES. NEAFC management measures include the full range from mesh size and fish size, closed seasons and areas, total allowable catches and their allocation, to the regulation of the amount of fishing effort and its allocation. The major straddling fish stocks NEAFC regulates include pelagic redfish, herring, blue whiting, mackerel, haddock and a variety of deep water species. In 2004, about 4 million tons was harvested in the convention area of which 1 million tons was taken in the regulatory area. In 2006 NEAFC established a Performance Review Panel as a follow-up to the 2006 UNFA review. The Panel expressed "considerable concern" that the contracting parties to the convention have in many instances been unable to take the necessary steps towards effectively implementing the convention by reaching agreed allocation arrangements in many fisheries. The Panel also found that status of the major fish stocks in the convention area is "at a critical point" and, unless effective action is taken promptly, "there is a strong possibility that their future sustainability will be compromised." The bottom line is that, as it is currently functioning, NEAFC's effectiveness is undermined by the failure of the coastal states to agree on rational TACs and national allocations for the major straddling stocks, which occur in the regulatory area as well as in waters under national jurisdiction.

The Northwest Atlantic Fisheries Organization (NAFO) Convention Area, established in 1979, applies to most fisheries resources of the Northwest Atlantic with the exception of salmon (which is managed by NASCO), tunas/marlins (ICCAT), whales and sedentary species. NAFO has 12 members from Central and North America, Europe and Asia. Among them are four coastal states bordering the convention area: Canada, Denmark (in respect of Greenland), France (in respect of St. Pierre and Miquelon) and the USA. NAFO has its own Scientific Council. The Fisheries Commission is responsible for the conservation and management of fisheries resources of the Regulatory Area outside the Canadian zone and south of Greenland. It annually decides on NAFO TACs, national allocations and other fisheries regulations, including monitoring, control and surveillance measures. NAFO started out with promise but came close to shipwreck many times in the intervening years. There has been a long record of non-compliance by some members with NAFO's allocations and technical measures. Most of the groundfish stocks managed by NAFO have been under moratoria for more than a decade. The widespread overfishing from 1985 onward, with brief periods of restraint, contributed to keeping the stocks at low levels. The shrimp fishery on the Flemish cap is proceeding under "wild West" rules. NAFO's contribution to sustainable management of straddling stocks has been marginal at best. In 2005, the Canadian government set up an Advisory Panel on Sustainable Management of the Straddling Stocks to examine the situation and recommend solutions. The Panel concluded that NAFO, as currently constituted, is an ineffective mechanism for sustainable management of the straddling stocks (Parsons 2005b; APSS 2005). Major problems identified were the voting formula, the objection procedure, and the need to rely on flag states for enforcement. Later in 2005 NAFO agreed to launch a reform process. Following the 2006 annual meeting NAFO issued a press release indicating that it had "made great progress with its ground-breaking reform agenda."(NAFO 2006) But the devil is in the details and these are still being negotiated. Whether the so-called "reforms" will remedy the long-standing deficiencies remains to be seen.

9.3 North Pacific

In the North Pacific there are two non-tuna RFMOs of interest. One is the North Pacific Anadromous Fisheries Organization (NPAFC). The NPAFC was established in 1992. The contracting parties include Canada, Japan, Republic of Korea, the Russian Federation and the United States. The primary objective is to promote the conservation of anadromous stocks in the convention area. The convention area is the waters of the North Pacific Ocean and its adjacent seas, North of 33° north latitude beyond the 200 miles zones of the coastal states. The species covered by the convention are as follows: chum, coho, pink, sockeye, chinook, cherry (all salmon species) and steelhead trout. Essentially the conservation measures under the convention involve: prohibiting directed fishing for anadromous fish in the convention area; minimizing, to the maximum extent , the incidental taking of anadromous fish; and prohibiting the retention onboard of fishing vessels of anadromous fish taken as an incidental catch during fishing for non-anadromous species. Each party has the authority to board, inspect and detain fishing vessels of the other parties found operating in violation of the convention. Only flag state authorities may try the offence and impose penalties. Generally the NPAFC has been successful in preventing fishing on the high seas of the North Pacific for anadromous species.

The second international agreement applying to the North Pacific is the Convention on the Conservation and Management of Pollock Resources of the Central Bering Sea. This convention was adopted in 1994, following concerns about an extensive distant water fishery

that developed in the mid to late 1980s in the high seas enclave (known as the Doughnut Hole) of the central Bering Sea area, beyond the US and Russian 200 miles zones. The main objective is to establish an international régime for conservation, management and optimal utilization of the pollock resource in the convention area. This convention does not provide for a commission. It does, however, specify the parties will convene an annual conference and establish a scientific and technical committee. An Annex to the convention sets out the allowable harvest level. According to this Annex, no fishing is permitted in the convention area unless the biomass of the Aleutian Basin Pollock stock exceeds the threshold of 1.67 million tons. Above this level and below any biomass level of 2.5 million tons, the Annex fixes progressive allowable harvest levels. Above 2.5 million tons, the allowable harvest level is up for negotiation by the parties. Enforcement is the responsibility of the flag states. All vessels fishing for pollock are required to carry an observer and to be fitted with satellite monitoring devices. The most recent biomass estimate is less than 500,000 tons, considerably below the target of 1.67 million tons that would allow for a fishery in the convention area. Hence, the allowable harvest is zero.

9.4 Tunas

There is a network of RFMOs whose mandate deals with tunas and tuna-like species. We have already discussed ICCAT which has a trans-Atlantic mandate for large pelagics. In the Pacific there are two major RFMOs responsible for tunas, the InterAmerican Tropical Tuna Commission (IATTC) and the recently established Western and Central Pacific Ocean Tuna Organization. Tunas in the Eastern Pacific fall under the mandate of the InterAmerican Tropical Tuna Commission (IATTC). The IATTC, originally established by international convention in 1950, amended in 2003, is responsible for the conservation and management of fisheries for tunas and other species taken by tuna fishing vessels in the Eastern Pacific Ocean. The member countries are: Costa Rica, Ecuador, El Salvador, France, Guatemala, Japan, Mexico, Nicaragua, Panama, Peru, Republic of Korea, Spain, United States, Vanuatu, and Venezuela. The species covered by the IATTC are: yellowfin and skipjack tunas and fish used as bait for tuna and other fish taken by tuna vessels. Skipjack are considered to be abundant. Yellowfin tuna are a lower-level, below the level of biomass that would produce the MSY. The IATTC also administers the International Dolphin Protection Program. In establishing conservation and management measures, the IATTC parties are to apply the precautionary approach and to ensure the conservation and management measures established for the high seas are compatible with those adopted for areas under national jurisdiction.

In September 2000, coastal states and fishing nations of the Western and Central Pacific adopted the "Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean." It was the first agreement to be negotiated on the basis of the UN Fish Stock Agreement following its adoption in 1995. Sydnes (2001b) analyzes the process leading up to the establishment of the regional fisheries management régime for the Western and Central Pacific tuna fisheries, the WCPFO. The tuna fisheries in the Western and Central Pacific are the largest in the world, yielding an annual catch of around 1.7 millions tons. Four major tuna species are faced: skipjack, albacore, yellowfin and bigeye. These species migrate extensively throughout the region, straddling the EEZs of the coastal states and areas of the high seas. On average, 65-70 percent of the tuna catches are harvested within the EEZs of the coastal states. The majority of the coastal states in the region are developing Pacific island states. Most have narrow land-based resources and vast areas of EEZs. Consequently, they rely on the tuna fisheries to develop their economies. 90% of the total catch of tuna in the WCPO is caught by DWFNs. The most important are

Japan, Taiwan, the USA in the Republic of Korea (Sydnes 2001b). This convention establishes the WCPO tuna commission, whose main function is to decide upon conservation and management measures. These measures include setting and allocating total allowable catches or levels of fishing effort, and adopting minimum standards for responsible fishing and technological regulations. Some innovations include novel enforcement measures including the provisions for boarding and inspection, Port state measures, a vessel monitoring system (VMS) and an Observer program. This convention goes the furthest so far in implementing the provisions of the UNFA. It is still too early to assess the success of the WCPO RFMO in putting in place effective measures for conservation and management of the major tuna species. But clearly the establishment of this RFMO represents a major step forward for the SIDS of the South Pacific, which derive major revenue from licensing of foreign vessels fishing tuna in their EEZs. In this respect, their situation is quite different from that prevailing in the insular Caribbean where there is much greater diversity of species in a relatively small area, but no really abundant high-value species to support a regional fisheries management organization.

Other tuna commissions of interest include the Indian Ocean Tuna Commission, the Western Indian Ocean Tuna Commission and the Southern Bluefin Tuna Commission. The Indian Ocean Tuna Commission is a commission established under Article XIV of the FAO Constitution. This Commission, unlike WECAF, has management powers. It is mandated to manage tuna and tuna-like species in the Indian Ocean and adjacent seas. The objective is to ensure conservation and optimal utilization of stocks and encourage sustainable development of fisheries based on such stocks. Species covered include yellowfin, skipjack, bigeye and albacore and several other tunas and tuna-like species. The catch of the 16 tuna and tuna-like species covered by the IOTC have exceeded one million tons annually since 1993. Tunas represent 85% of this total. This does not include catches by fleets under flags of convenience that do not usually report their catches. The Indian Ocean differs from the other areas discussed in that artisanal fisheries take as much as industrial fisheries. There are currently 24 members and two Cooperating Non-contracting Parties. Of the members, approximately half are coastal states in the area. There is also on the books a Western Indian Ocean Tuna Organization (WIOTO), which was signed in 1991 and entered into force in 1992. This convention was developed primarily in response to the perception of the SIDS in the Southwest Indian Ocean that the existing FAO regional initiatives were European dominated. The organization is not operative because of financial constraints.

There is also an RFMO for the conservation of the Southern bluefin tuna. The Southern bluefin tuna is found in open Southern hemispheric waters of all the world's oceans, mainly between 30° south and 50° south to nearly 60° south. The Convention between Australia, Japan and New Zealand came into force in 1994. Later the Republic of South Korea and Taiwan joined and the Philippines, South Africa and the European Union are Cooperating Non-parties. The Southern bluefin tuna is classified as critically endangered on the IUCN Red list of Threatened Species. Recently, Total Allowable Catches have been cut in an attempt to stabilize resource abundance.

9.5 The Baltic Sea

Earlier I discussed the multi-species RFMOs in the North Atlantic. The North Atlantic also has two adjacent seas, the Baltic Sea in the North and the Mediterranean in the South. I will deal with these in more detail because both are semi-enclosed seas analogous in some respects to the insular Caribbean but different in other respects.

The Baltic Sea is a semi-enclosed sea adjacent to the Northeast Atlantic. It is strongly influenced by human induced eutrophication, river run-off, and a lack of rapid exchange with the Atlantic. Intensive fishing is the primary driving force, with eutrophication second.

More than 200 rivers empty into the Baltic Sea, providing a drainage area approximately four times larger than the sea itself. The Baltic Sea is a semi-enclosed brackish water area, the second-largest in the world after the Black Sea. The Baltic Sea supports both marine fish in high salinity water and freshwater species near the coast. The fisheries catch level averaged 800,000 tons during the 1990s. Small pelagic clupeiods (herring and sprat) constitute almost 80% of the shelf catch. Cod and related species represent the second-largest group.

In the Baltic, fisheries management was undertaken by the International Baltic Sea Fishery commission (IBSFC) until it was disbanded in 2006. The Helsinki Commission -- Baltic Marine environmental protection commission (HELCOM) -- carries out management of environmental issues. ICES provides scientific advice to both these bodies.

The IBSFC during the last 15 years of its existence consistently established Total Allowable Catches substantially greater than those suggested by the scientific advice. The majority of the most commercially important fish stocks in the Baltic are classified as "outside safe biological limits", the result of unsustainable fishing pressure and practices. The total annual catch of commercially important sea fish stocks in the Baltic increased tenfold in the past half-century. During the last two decades the effects of overfishing became increasingly visible. Nearly all commercially important fish stocks -- including cod, wild salmon, herring and sprat -- are overfished. The catch of cod, for example, declined from the peak of 450,000 tons in the mid-1980s to about 50,000 tons by 1992 and has been around 100,000 tons since then. Over the last 20 years the stock size of Baltic cod reached its lowest level on record in 1991 and has remained low since then. Industrial fishing for herring and sprat has increased. Unsustainable fishing practices have also harmed the marine ecosystem through bycatch and discarding of fish, bottom living organisms, seabirds and marine mammals, and degradation by bottom trawling of vulnerable habitats. Even when the regulatory commissions have agreed on remedial action, there is often a lack of political will at the national levels to take the steps necessary to restore depleted fish stocks and protect marine ecosystems (Thulin and Andrushaitis, 2003).

One of the regulatory commissions -- the IBSFC -- has been disbanded. This is the result of the rapid expansion of the European Union into Eastern Europe. Sweden, Finland, Germany and Denmark were already members of the EU. Recently, Poland, Estonia, Latvia and Lithuania have also joined. This means eight of the nine countries bordering the Baltic are now members of the EU. Under these circumstances the EU chose to withdraw from the IBSFC, thus precipitating its demise. In future, fisheries governance of the Baltic will be conducted bilaterally between the EU and the Russian Federation. What impact this will have on resource management remains to be seen.

9.6 The Mediterranean Sea

The Mediterranean Sea is another semi-enclosed sea, adjacent to the Atlantic. It has several distinct biogeographical units and is bordered by a high number of countries (20) with differing cultures. Like the Baltic Sea, intensive fishing is the driving force, with eutrophication second. The Mediterranean has a narrow Continental shelf. The major inflow into the Mediterranean is nutrient poor, oxygenated Atlantic surface water through the Strait

of Gibraltar. Overall, the Mediterranean is a low productivity ecosystem, but it has unusual biodiversity for a temperate sea (Caddy 1993).

From a fisheries perspective, the Mediterranean is one of the most diverse and stable marine ecosystems in terms of species and their contribution to the catch. Through the 1990s catches ranged around one million tons. Clupeiods are the most important species group, yielding 38% of the catch. Miscellaneous coastal fishes account for 18% of the catch and mollusks 16%. Fishing effort has been on the increase and catch rates per vessel have been declining. Distant water trawlers have fished the less productive Southern shelves for demersal resources, fishing them at close to the maximum sustainable yield. There have been some declines, especially in the northern Mediterranean, of fish species and species diversity.

The Mediterranean has 26,000 km of coastline with 132 million inhabitants along that coastline. Tourism has been increasing, and is of higher economic value than fisheries in many Mediterranean countries. Tourism is contributing to environmental degradation. The Mediterranean, situated at the crossroads of Africa, Europe and Asia, has a high diversity of cultures, countries, political systems and religions.

Transboundary fisheries in the Mediterranean are governed by the General Fisheries Commission for the Mediterranean (GFCM). The GFCM was established by an agreement under Article XIV of the FAO Constitution in 1949. The area of competence of the Commission is the Mediterranean and Black Seas and connecting waters. In 1997, it was agreed to change the name from "Council" to "Commission". Until 2004 the GFCM was financed by the FAO, but under the 1997 agreement it adopted an amendment that provided for an autonomous budget (this took effect in 2004).

Coastal states in the Mediterranean have not declared extended fisheries jurisdiction and the Mediterranean for the most part remains a high seas area. With a few exceptions, most states bordering the Mediterranean have 12 miles territorial seas but no further competence beyond 12 miles. In some areas of the Mediterranean the Continental shelf extends far beyond 12 miles and stocks occurring on the shelves are accessible to fishermen from outside the region.

A wide variety of fishing gears are used in the Mediterranean, including bottom trawls, dredges, purse seines, surface longline, driftnets and artisanal gear. There are numerous transboundary species/stocks, e.g. hake, red mullet, striped mullet, blue and red shrimps, Norway lobsters, anchovies, sardines and dolphinfish. There are also highly migratory stocks such as the eastern Atlantic bluefin tuna and swordfish. The GFCM cooperates with ICCAT with respect to the management of bluefin tuna through a joint working group.

Bycatch issues are significant in the Mediterranean, particularly involving sharks and the juveniles of target species. Mitigation measures include gear restrictions for certain vessels, limits on bycatch, minimum sizes for fish that may be landed and measures to limit the fishing effort. The Mediterranean Large Elasmobranch Monitoring Program (MEDLEM) has a protocol for mitigating shark bycatch. In 2004, ICCAT adopted a recommendation, which prohibits the catch of Atlantic bluefin < 10 kg in the Mediterranean.

In 2005 the GFCM prohibited the use of towed dredges and trawl fisheries below 1000 m in order to protect deepwater species. With respect to monitoring, control and surveillance there are no provisions for observers, nor a VMS system, although these are under discussion. There is also no provision for at sea boarding inspections as exist in most RFMOs. In 2005 the GFCM adopted a binding recommendation to establish a registration system for vessels >

15 m. Vessels not on that list will be considered to be engaged in IUU fishing. The bottom line, however, is that enforcement in the Mediterranean essentially rests with member countries.

Beginning in 2003, spearheaded by the EU, initiatives have been launched to reform the GFCM and to make it a more effective RFMO. The initial focus has been on bringing in more effective fishing effort limitations, strengthening the scientific basis for fisheries management decisions, and implementing a compliance régime. At the GFCM's annual meeting in January 2007, it agreed on a range of new measures to come to grips with overfishing. Progress was made on fishing effort limitations by type of vessel and gear. The meeting also agreed on the use of new, more selective types of netting in bottom trawls. The Commission agreed on a common set of benchmarks for measuring the capacity of fishing fleets in the region and assessing their impacts on shared fish stocks, the first time such a unified system has existed in the Mediterranean. The compliance committee of GFCM has become operational and will work on the development of a control and inspection scheme for the Mediterranean. The Commission also signed off on new rules for tuna fishing, recently adopted by ICCAT. These measures include a 15-year recovery plan for bluefin tuna, starting in 2007 and running through 2022.

9.7 Observations on RFMOs

While some RFMOs are now reforming their structures and procedures in search of more effective arrangements for governance of transboundary fisheries resources, most RFMOs have had a chequered record over the past 25 years. Successes are few. From the examples examined here, it is clear that most RFMOs are still struggling to find their way toward conservation and sustainable use. Most of the world's living marine resources are either fully exploited or overexploited and overfishing is a growing global threat. On the other hand, if there were no RFMOs in place, the status of the world's fisheries resources would probably be even more precarious.

Major issues with existing RFMOs include: the abuse of objection procedures where these exist; inadequate compliance mechanisms; reliance on flag state enforcement; ignoring scientific advice on the status of fish stocks and fishing beyond "safe biological limits"; and the struggle between those who wish to conserve resources for sustainable use versus those who prefer to maximize short-term gain.

10 Conclusions

The focus of this paper has been on the nature and extent of transboundary fisheries governance challenges in the Caribbean and options for addressing these. The Wider Caribbean is geographically one of the most complex regions in the world. The geographic complexity of the region results in a very complex biodiversity. One feature of the Caribbean is the lack of a functional unified political authority. There are a series of overlapping regional authorities. This constitutes a significant barrier to holistic regional marine fisheries governance. The small island developing states in the Caribbean have a particularly high stake in marine fisheries management, as their ratio of marine area to land area or population is significantly higher than for mainland states.

Although the Western Central Atlantic does not support any of the world's major fisheries and contributes less than 2% of world fisheries landings, the fisheries there are very

important to the countries involved. Harvesting of fisheries resources in Caribbean countries is primarily artisanal or small-scale. Most of the fisheries resources of the Caribbean are either fully exploited or overexploited, with some exceptions. The sheer variety of fish and invertebrates occurring in the Caribbean and the lack of adequate (or complete absence) of data for most species/stocks pose major obstacles to effective transboundary fisheries governance. This is further compounded by the transboundary nature of most species, either in the adult or early life history stages, and the linguistic and cultural divides among the many states and territories.

Although some organizations have evolved to deal with certain aspects of fisheries governance in this region, e.g. WECAF, CARICOM/CRFM and OSPESCA, these do not provide a comprehensive umbrella with a sufficiently broad mandate to provide effective transboundary governance throughout the Caribbean. While WECAF's geographic scope includes all waters of the Western Central Atlantic and its mandate includes all living marine resources, the Commission is not actively involved in fisheries management/governance in the region. It does not have any regulatory powers and functions only in an advisory capacity. CARICOM established the Caribbean Regional Fisheries Mechanism. CRFM's mandate includes the efficient management and sustainable development of marine and other aquatic resources within the jurisdiction of member states. The establishment of the CRFM was a positive step on the path to sustainable fisheries within the Caribbean but CARICOM only encompasses a portion of the states and territories in and bordering the Caribbean. By itself, it cannot provide comprehensive governance of transboundary fisheries resources throughout the Caribbean. The same is true for OSPESCA whose mandate is more to promote collaboration among the countries of the Central American Isthmus.

ICCAT is the international fisheries management organization whose mandate includes major species (tunas) throughout the Caribbean. While the oceanic pelagic species with which ICCAT concerns itself may hold the greatest potential for expansion of fisheries within the Caribbean, the coastal pelagic species provide most of the present yield. Although these coastal pelagic species fall under the auspices of ICCAT, they have received little attention from ICCAT. Existing arrangements with ICCAT are inadequate to address the interests and needs of Caribbean states in the fisheries for large pelagics, both oceanic and coastal.

Statistical information on the quantities and species of fish being caught in Caribbean fisheries is poor. Scientific assessment of the status of Caribbean fisheries resources is inadequate, at best. Fisheries administrations in Caribbean countries vary widely in levels of staffing and expertise. Small fisheries administrations lack the expertise and numbers of staff to address statistics, research and management. Another deficiency is the lack of resources to carry out adequate monitoring, control and surveillance.

Fisherfolk organizations in many Caribbean countries are relatively weak. This poses serious structural and operational constraints to their involvement in fisheries governance at any level. While there is a clear need to involve stakeholders more at local, national and regional levels, this is difficult to achieve under these circumstances.

Current arrangements for transboundary fisheries governments in the Caribbean are fragmented. Any new governance mechanisms should be comprehensive while allowing for scale -conscious and scale -appropriate sub mechanisms. There should be clear lines of accountability from stakeholders at the national level and national governments through to the intergovernmental mechanisms, with provisions for feedback. Decision-making procedures should be clearly articulated. Provisions for decision-making, voting and

allocation criteria need to be structured to provide for equity, both real and perceived. Any new arrangement needs to be cost effective, bearing in mind the tremendous diversity of fisheries and cultures in the Caribbean. Any new mechanisms should also include provisions for sub-structures that allow decisions to be taken by those with the greatest interest in, and knowledge of, particular fisheries resources (geography/species).

A new governance arrangement should incorporate the precautionary approach since the poorer the information base, the greater is the need for caution. It should also make clear provisions for taking ecosystem considerations into account in fisheries management since fish species cannot be properly managed in isolation of each other and without regard for the marine ecosystems of which they are part. Sustainability of living marine resources has to be a primary goal. Without conservation of the resources and their habitats, sustainable use is not possible.

Elsewhere in the world, particularly in the post-UNCLOS and post-UNFSA era, regional fisheries management organizations (RFMOs) are seen as the mechanisms for good governance at the regional level. Regions are increasingly viewed as the appropriate level to cooperate on fisheries issues that cannot be appropriately addressed at the global or national levels. The UN Fish Stocks Agreement of 1995 is the most comprehensive of the international instruments in defining the role of regional fisheries management organizations. Chief among these is that states must agree on and comply with conservation and management measures to ensure the long-term sustainability of fish stocks. States are also charged with agreeing on participatory rights, such as allocation of allowable catch or levels of fishing effort.

An examination of RFMOs around the world indicates that most RFMOs have had a chequered record over the past 25 years. Successes are few. From the examples examined here, it is clear that most RFMOs are still struggling to find their way toward conservation and sustainable use. Most of the world's living marine resources are either fully exploited or overexploited and overfishing is a growing global threat. The killing power of the world's fishing fleets far outstrips the capacity of the living resources to sustain them. On the other hand, if there were no RFMOs in place, the status of the world’s fisheries resources would probably be even more precarious. Many RFMOs are now reforming their structures and procedures in search of more effective arrangements for governance of transboundary fisheries resources.

Of the RFMOs examined in this study, two are concerned with the governance of transboundary fisheries resources in semi- enclosed seas, namely, the Baltic Sea and the Mediterranean Sea. The International Baltic Sea Fishery Commission (IBSFC), which has consistently established TACs at levels above those advised by scientists, has recently been disbanded. It was disbanded because eight of the nine countries bordering the Baltic are now members of the European Union. Henceforth, governance of transboundary fisheries resources in the Baltic will be dealt with internally within the EU, or bilaterally with the Russian Federation. This renders the Baltic situation quite different from that of the Caribbean.

The Mediterranean Sea has some similarities to the Caribbean. It is bordered by a large number of countries (20) with widely differing cultures and religions. It is a complex geopolitical region, with a high diversity of species and fisheries. Transboundary fisheries governance in the Mediterranean falls under the auspices of the General Fisheries Council for the Mediterranean (GFCM). Originally established like WECAF as a coordinating body

under FAO, it has evolved into a regional fisheries management commission with a regulatory mandate under Article XIV of the FAO Constitution. Recently, the EU has spearheaded efforts to turn the GFCM into a more effective RFMO with real teeth and improved compliance mechanisms. One significant difference between the Caribbean and the Mediterranean is that the Mediterranean is surrounded by many developed countries that can afford the cost of a full-fledged RFMO for the Mediterranean.

In theory, WECAF could become an RFMO like the GFCM. This has been discussed in WECAF numerous times in recent years. It has chosen to remain an advisory body under Article VI of the FAO Constitution. Nonetheless, it is clear that major changes are required in the arrangements for governance of transboundary fisheries resources in the Wider Caribbean. The current fragmented approach to governance is inadequate and ineffective. More effective regional governance requires new or modified institutions.

One pressing issue is the need for improved governance for large pelagics. For oceanic species, the mechanisms for direct involvement in ICCAT need to be strengthened so that Caribbean states can have a more reasonable prospect of securing allocations proportionate to the contribution the Wider Caribbean plays in the life history of these species. For coastal pelagic species, there is the need for a regional arrangement. This could be a subsidiary of ICCAT or a separate entity with close collaboration if ICCAT is willing to delegate its responsibilities for coastal species to a new Caribbean regional organization designed for this purpose.

To achieve more effective regional governance for all transboundary living resources in the Caribbean, three alternatives have been examined in this study. These are:

- A Coordinated Network
- A single RFMO with departments
- An all-inclusive RFMO.

An all-inclusive single unitary RFMO would apply one process to all countries, with all countries involved in the assessments and decision-making for all resources. This seems both inappropriate and unachievable for the Caribbean. The geopolitical complexity and diversity of species and countries require a more nuanced approach.

The other extreme would be a Coordinated Network. Under this scenario governance would be achieved through a network of formal and informal multilateral agreements for the various resources/regions of interest. The network would seek to establish common principles and practices where appropriate. Compliance would be voluntary. One major problem with this approach is that it would be difficult to achieve regional decision-making under such an informal network arrangement. Given the current overfished status of many Caribbean fisheries resources, timely action is required to ensure a sustainable resource for the future. It is difficult to envisage this being achieved through a network that is a mixture of formal and informal arrangements.

This leaves the option of one overall RFMO but with departments/panels for various subsets of regions or resources. This would allow for different arrangements to be implemented for different species groups or regions. These could be semiautonomous entities operating under the umbrella of the overall RFMO. One major advantage would be flexibility. Flexibility could extend to financing arrangements with countries being able to opt in or out of the

substructures depending on their interest in, and the perceived benefits of, participating in the various components. Departments/panels could be assigned in such a way as to best address issues of geography, ecosystem, resource type and expertise available.

The Caribbean is a unique semi-enclosed sea with a high density of independent small states and hence requires a solution tailored to the special characteristics of the Caribbean. For the reasons identified previously, a region-wide governance organization (RFMO) with substructures/mechanisms tailored to meet the needs of geography, resources and participants would seem to be the best option to meet the needs of the Caribbean region. Whether this is practical and achievable remains to be seen but it merits further study. Designing and implementing such a regional approach would not be a simple task. One of the major challenges would be to bridge cultural/historical divides. Another would be to find an appropriate formula for funding such an arrangement, given the economic disparity between some of the lesser-developed states and the larger wealthier countries of the region. Designing and implementing such a new regional governance mechanism would take a great deal of time, effort, expertise and, in particular, political will.

It may well be necessary to pursue this in a step-wise manner, using a co-ordinated network approach and pilot projects to set the stage for an eventual fundamental change in regional governance.

In conclusion, whichever option for change seems preferable, it is clear that the current system of fragmented governance for transboundary fisheries resources in the Wider Caribbean is not sustainable and that new or modified institutions and processes are necessary.

11 Acknowledgements

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13 FIGURES AND TABLE

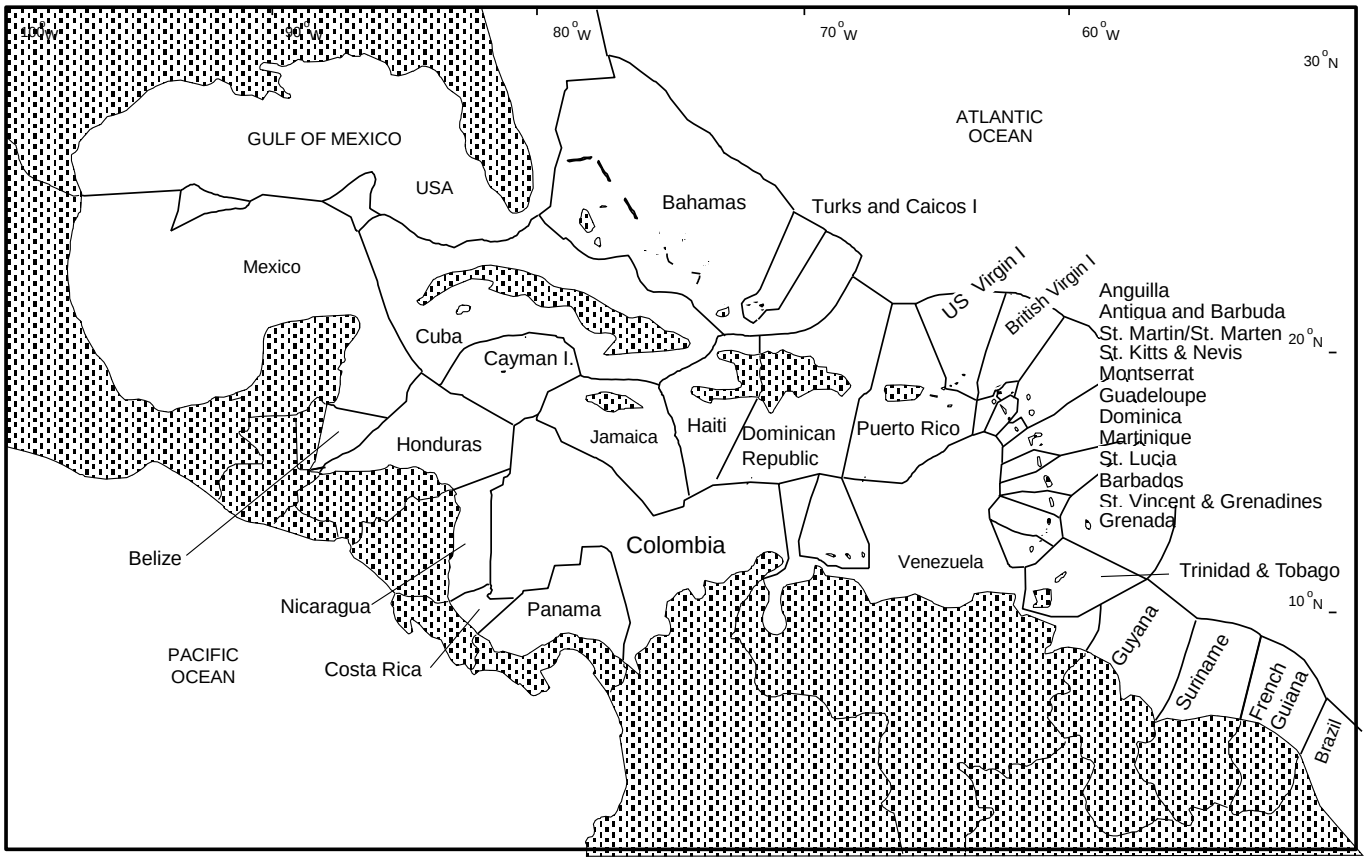

Fig. 1. The countries of the Wider Caribbean and their hypothetical EEZs**.**

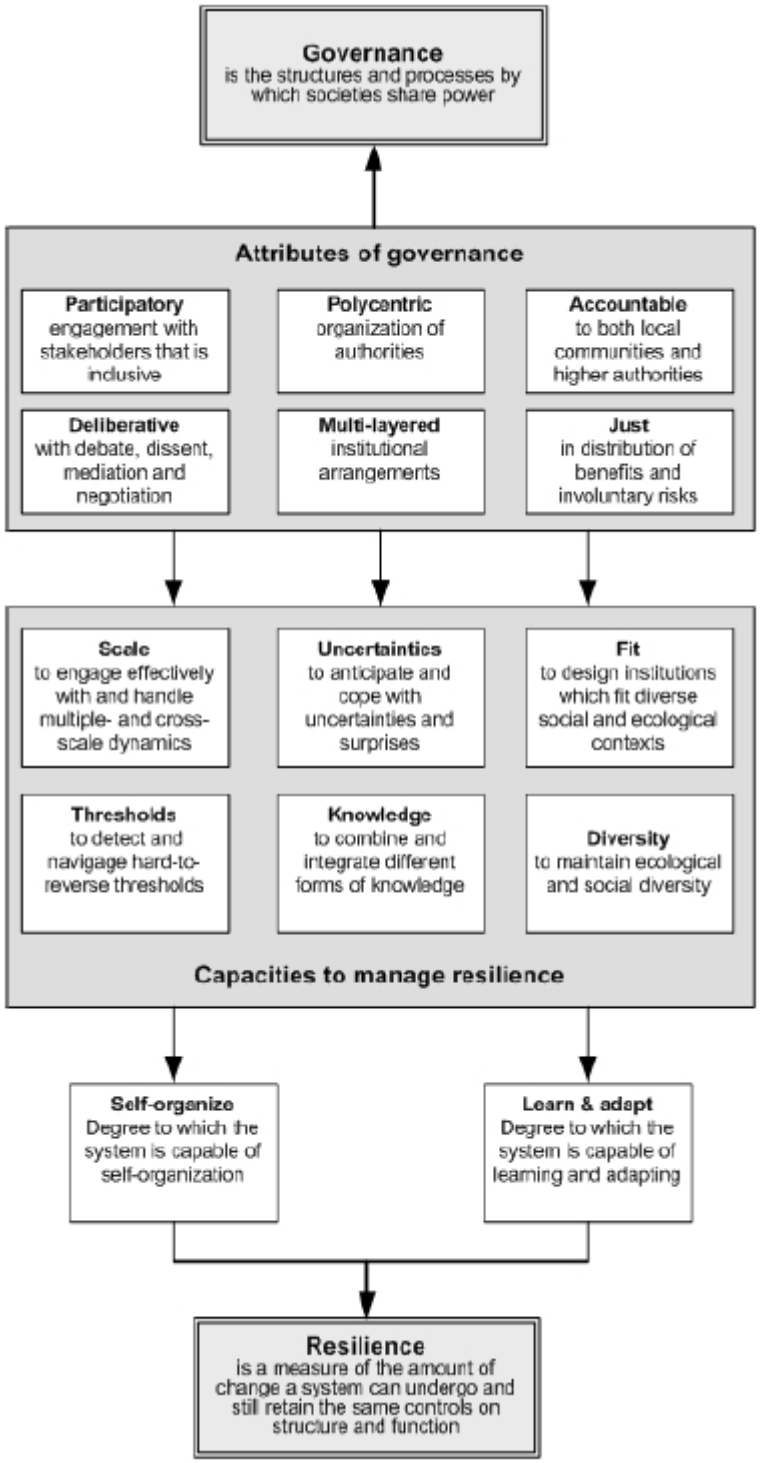

Fig. 2. Associations between selected attributes of governance systems (adapted from Lebel et al 2002)

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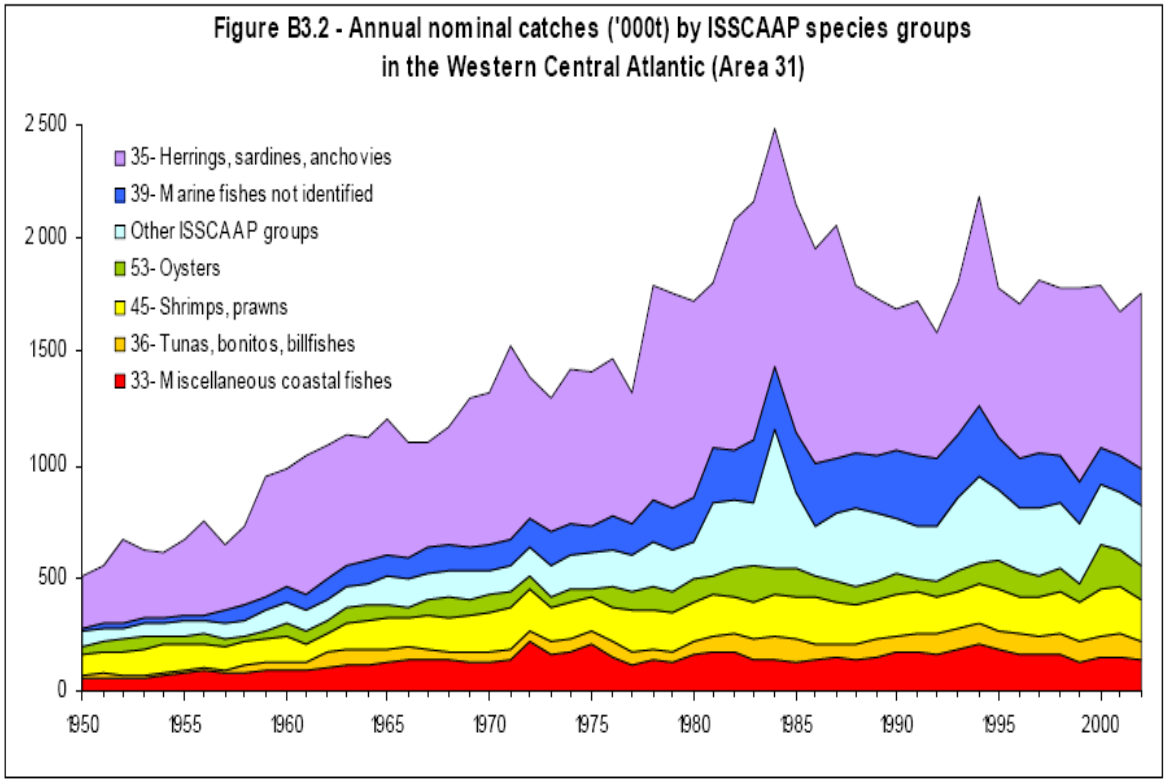

Fig. 3. Annual nominal catches in the Western Central Atlantic from 1950 to 2002. Source: Cochrane ((FAO) 2005)

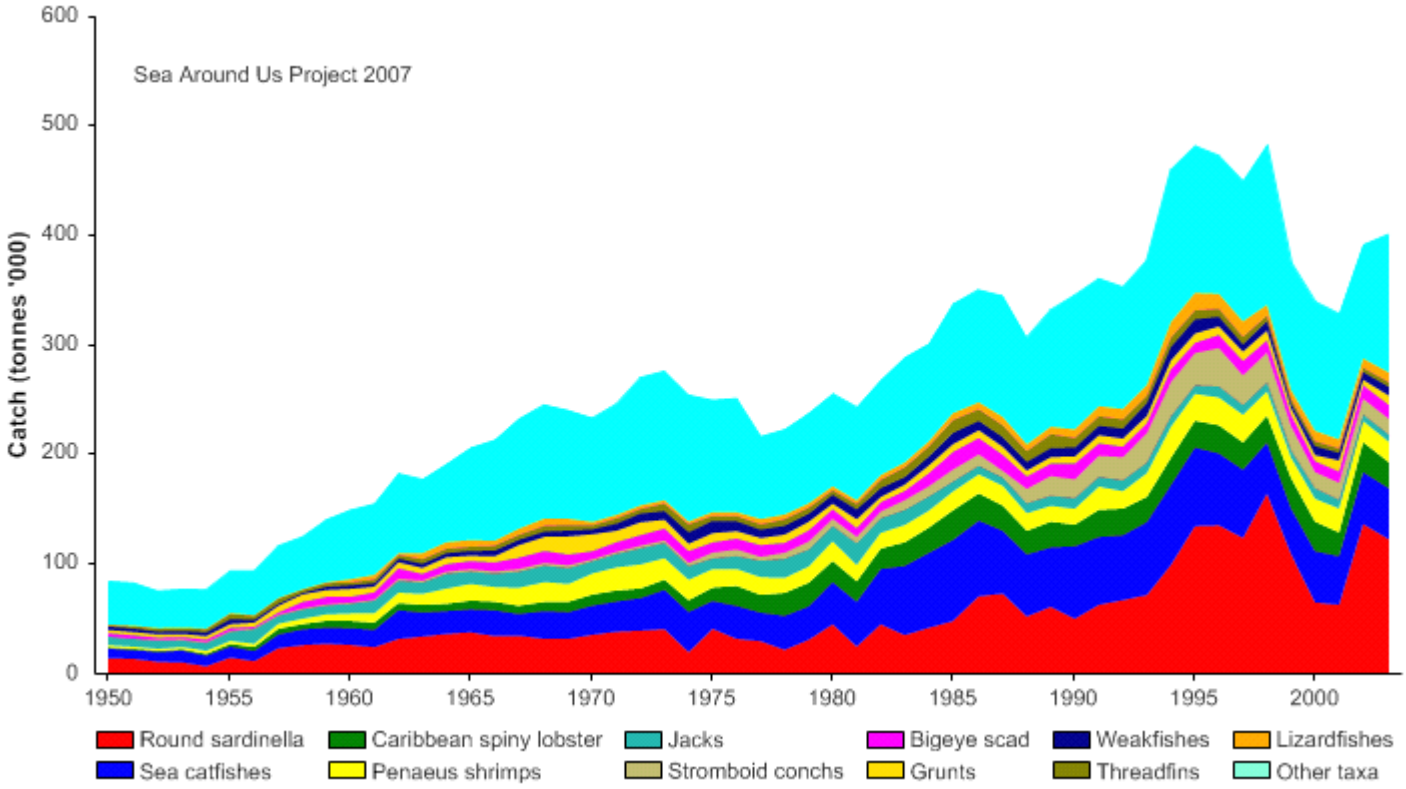

Fig.4. Fish landings from the Caribbean Sea by taxonomic group

Source: Sea Around Us Project UBC

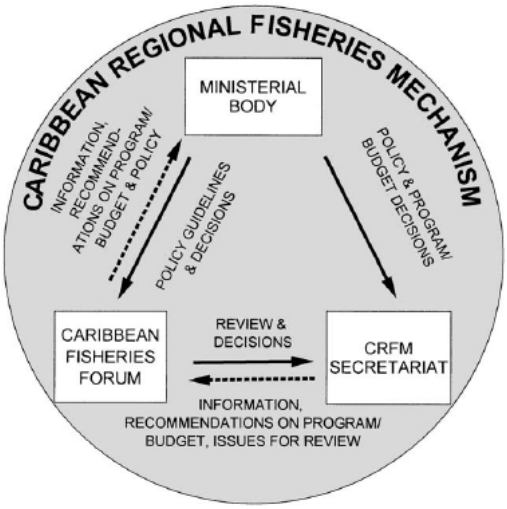

Fig. 3. The Caribbean Regional Fisheries Mechanism.

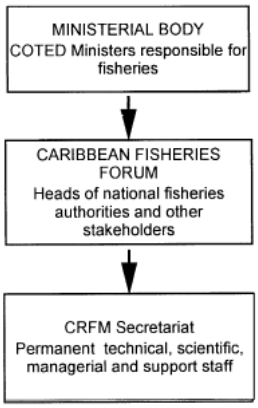

Fig. 4. The hierarchy of decision-making within the CRFM.

the CRFM, is the highest policy and decision-making

Fig. 5. The Caribbean Regional Fisheries Mechanism and the Hierarchy of Decision-Making within the CRFM. Source: Haughton et al 2004.

Table 1. The relative importance of various fisheries to Caribbean countries and their state of exploitation (see text for description of each fishery type). Illegal foreign fishing is indicated by shading. Source: Mahon 2002.

Caribbean State	Fishery type									
	Lobster	Conch	Reef fish	Slope/ Bank	Large pelagic	Flying-fish	Coastal pelagic	Shrimp	Ground-fish	Coastal demersal
Antigua/Barbuda	%%% f	%% o	%%% f	% u	% u		% f			
Bahamas	%%% f	%% f	% u	% u	% u					
Barbados	% f		% f	%% f	%%% u	%%% u	% f			
Belize	%%% f	%%% o	%% u	% u	% u		uk	%% f		
British Virgin Islands	%% o	%% o	%% f	% u	% u		% u			
Dominica	% o	% o	%% o	%% u	%%% u	% u	% f			
Dominican Republic	%% o	%% o	%%% o	% u	% u		% uk	%% o		
Grenada	%% o	%% o	%% o	% u	%%% u	% u	%% f			
Guyana				%% f	% u		% u	%%% o	%% o	%% uk
Haiti	%% o	%% o	%%% o	% u	% u		%% f	% o		
Jamaica	%%% o	%%% o	%%% o	% f	% u		% u			
Montserrat	% o	% o	%%% o	% u	%% u		% f			
St. Kitts/Nevis	%% o	%% o	%%% o	% u	% u		%% f			

St. Lucia	%	%%	%%%	%%	%%%	%%	%			
	o	o	o	u	u	u	f			
St. Vincent/Grenadines	%%	%	%%%	%	%%%		%%			
	o	o	o	u	u		f			
Suriname				%%	%		%	%%%	%%	%%
				f	u		u	o	o	f
Trinidad/Tobago	%	%	%%	%%	%%	%%	%%	%%	%	%
	f	f	o	u	f	u	u	o	f	f

%%% = Extremely important, %% = Important, % = Significant

f = Fully exploited, o = Overexploited, u = Underexploited, uk = unknown

Illegal foreign fishing: Extensive problem Problem in certain areas

1. The indication that large pelagics are underexploited means that the country is not taking a share which would be expected on the basis of the size of its EEZ. If all countries develop the relevant capacity to exploit, the resources will certainly become overfished.

2 Resource status is largely based on circumstantial evidence . Foreign fishing is indicated by shading.

14 Appendix I Functions of an RFMO (Article 10 of UNFSA)

Functions of subregional and regional fisheries management organizations and arrangements

In fulfilling their obligation to cooperate through subregional or regional fisheries management organizations or arrangements, States shall:

(a) agree on and comply with conservation and management measures to ensure the long-term sustainability of straddling fish stocks and highly

migratory fish stocks;

(b) agree, as appropriate, on participatory rights such as allocations of allowable catch or levels of fishing effort;

(c) adopt and apply any generally recommended international minimum standards for the responsible conduct of fishing operations;

(d) obtain and evaluate scientific advice, review the status of the stocks and assess the impact of fishing on non-target and associated or dependent species;

(e) agree on standards for collection, reporting, verification and exchange of data on fisheries for the stocks;

(f) compile and disseminate accurate and complete statistical data, as described in Annex I, to ensure that the best scientific evidence is available,while maintaining confidentiality where appropriate;

(g) promote and conduct scientific assessments of the stocks and relevant research and disseminate the results thereof;

(h) establish appropriate cooperative mechanisms for effective monitoring,control, surveillance and enforcement;

(i) agree on means by which the fishing interests of new members of the organization or new participants in the arrangement will be accommodated;

(j) agree on decision-making procedures which facilitate the adoption of conservation and management measures in a timely and effective manner;

(k) promote the peaceful settlement of disputes in accordance with Part VIII;

(l) ensure the full cooperation of their relevant national agencies and industries in implementing the recommendations and decisions of the organization or arrangement; and

m) give due publicity to the conservation and management measures established by the organization or arrangement.