



Caribbean Large Marine Ecosystem (CLME) Project

CLME Full Project component 4: Flyingfish pilot project

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1 Background

In the southern Lesser Antilles the fourwing flyingfish (*Hirundichthys affinis*) is the single most important small pelagic. It is fished by seven countries: Trinidad and Tobago, Grenada, St. Vincent and the Grenadines, Barbados, St. Lucia, Dominica and France (Martinique). The total landings for these countries are about 3000-4000 mt making a relatively small fishery (Ferreira 2002). However, over 1700 boats are engaged in this fishery which is pursued from a variety of small to medium scale vessels from numerous often rural landing sites in the participating countries. Consequently, there is a high social and economic dependence on this fishery. There is also considerable value added from the onshore processing, distribution and sale of the catch. In Barbados the landed value of the catch between 1999 and 2003 was about US\$ 1.8 M a year with the added value being a further US\$ 13.8 M a year for a total value of US\$ 15.6 M.

There was an increasing trend in landings through the 1980's owing to the rapid expansion of the fleet and area fished. During this period the fishing fleet in Barbados expanded rapidly and total landings of flyingfish more than doubled. This led to concern that the resource may become overfished and to increased attention to acquiring the information needed for management

A substantial body of information has been acquired on flyingfish fisheries over the past three decades. The Eastern Caribbean Flyingfish Project that culminated in a workshop in 1992 provides a synthesis of the information up to that point (Oxenford *et al* 1993). At that workshop key conclusions regarding the biology of flyingfish were that it is essentially an annual species, and that there is mixing of adults throughout the eastern Caribbean. Therefore, the resource should be managed as a single stock.

Subsequent research has indicated that the Eastern Caribbean stock is distinct from the neighboring stocks exploited by the fisheries of Brazil and Curacao. It has also confirmed that the Eastern Caribbean flyingfish should be considered as a single stock. This research has revealed restricted gene flow within the eastern Caribbean stock that may have implications for the way that the stock is managed, since there may be sub-stocks within the region (Gomes *et al* 1998, 1999).

An evaluation of assessment options for flyingfish concluded that the overriding feature of the resource was its high interannual variability in abundance. Analyses indicate that yield per recruit would be optimized at average age of capture well below the average age of maturity. Thus it is not a useful approach for this fishery. The relationship between stock and recruitment was not clear, but indicated a tendency for recruitment to be lower than average when stock size was lower than average. A preliminary analysis of the relationship between recruitment and environmental variables did not reveal any strong environmental influences that might be used to predict recruitment success (Mahon 1990a).

A risk analysis indicated that the fishery could be expected to exhibit undesirable characteristics, such as increased interannual variability that may result in prolonged periods of low catch even at the fishing mortality that produces maximum long-term sustainable recruitment. Indications are that an increase in landings of 15-20% over the levels of the early 1990s could take the resource into the vicinity of the threshold. Therefore, it would be precautionary to keep fishing mortality somewhat below that level. Exactly where it should be kept would depend on the management objective for the fishery. That is, whether it was more important to obtain the greatest catch, or to reduce interannual variability and thus promote stability in the fishery.

The Pelagic and Reef Fishes Subproject of the CARICOM Fisheries Resource Assessment and Management Programme (CFRAMP) included an activity to address aspects of eastern Caribbean flyingfish. At the Small Coastal Pelagic and Flyingfish Subproject Specification Workshop (SSW) in Grenada in 1996 papers were presented reviewing the status of flyingfish fisheries and outlining proposed research and management activities for flyingfish. These activities were not carried out owing to lack of funding. The contributions to the SSW although not published address a number of topics that deserve attention: biology, life history and ecology (Nakashima 1996a, Monteiro, *et al.* 1996, Singh-Renton 1996), social science (McConney 1996), fishing practices (Mohammed 1996), fishery assessment and management (Cochrane 1996, Nakashima 1996b). Country reviews presented at this workshop also provide another waypoint in description of national fisheries for flyingfish.

The existence of a southeastern Caribbean management unit for *H. affinis*, was further recognised by the WECAFC Working Party on Marine Resources in Belize City 1997 (FAO 1998). In 1997 WECAFC established an *Ad Hoc* Flyingfish Working Group that has met twice in Barbados: September 1999 (FAO 1999) and January 2001 (FAO 2002). At the first meeting an analysis of catch and effort data from five countries over the period 1982-1998 was carried out but the data did not show any trends and were considered inadequate for analysis (FAO 2002). The WG identified three activities that should be pursued towards the cooperative management of the southeastern Caribbean flyingfish stock:

- Analysis of fishery catches and fishing effort
- Review of social and economic aspects
- Preparation of a Regional Fisheries Management Plan (FMP).

At the second meeting of the WG in 2001, re-analysis of catch and corrected effort data was attempted in a workshop setting, but the data for all islands except Barbados were confounded by an inability to distinguish between vessels that targeted flyingfish and those that did not (FAO 2002). Some of the sociological information on the flyingfish fishery identified at the first meeting as being needed was collected and presented at the second working group meeting in 2001 (FAO 2002). Country fishery updates presented at both WG meetings provide the most recent information on the fisheries (FAO 1999, 2002). The regional FMP was developed in draft form and remains to be reviewed and adopted (Oxenford 2002).

In the meantime, access to flyingfish stocks continues to be a contentious issue between Barbados and Trinidad and Tobago. Much of the contention appears to centre on perceptions of trade rather than scientific issues. The results of the ECFFP were a major component of the information synthesised in the first months of 2003 by the Joint Technical Working Group (JTWG) established by these two governments to put together the best available body of information on this fishery. Still lacking is an appropriate governance mechanism for the resource. The JTWG and the WECAFC WG provide the opportunity for exchange and synthesis of technical information, although the former involves only two of seven states involved in the fishery, but there is still no appropriate forum for decision-making for this fishery.

2 Objectives:

The purpose of the flyingfish pilot project is to establish a regular subregional management and policy cycle for the shared flyingfish stock of the southeastern Caribbean that utilizes the best available information from all sources, develops a regional management plan, provides advice to

a legitimate decision-making body, makes transparent decisions and implements them in timely fashion.

Specific objectives include:

- Identifying and engaging the full range of stakeholders in each stage of the cycle,
- Establishing and operating the stages of the cycle,
- Enhancing linkages between the regional cycle and other relevant cycles at lower and higher levels.

3 Activities

The following activities are proposed as being necessary to achieve the objectives described above:

- Stakeholder analysis (governmental and civil society) including assessment of capacity to take part in the regional management process,
- Specification of, and obtaining stakeholder agreement upon, an appropriate management cycle for flyingfish
- Technical sessions of the FAO WECAFC Ad Hoc Working Group on Flyingfish
- Identification and support of meetings of an appropriate regional political forum for policy decision-making.
- Research to fill gaps identified by operating the cycle.

4 Outputs

- A regional management plan that identifies:
 - Processes by which policy is set, management will be reviewed, decisions taken and management implemented,
 - Roles and responsibilities of stakeholders at all levels,
 - Current and proposed linkages among stakeholders,
 - Actions to be taken by national and regional management organizations to achieve sustainable use of the eastern Caribbean flyingfish resource and achieve WSSD targets,
 - Ecosystem-based management approach for flyingfish,
 - Information gaps that need to be filled to improve management.
- Implementation of two full cycles of the process, including:
 - Review and adoption of the plan according to the processes,
 - Implementation of key actions,
 - Review and evaluation of implementation.

5 Management structure and accountability

The project will be led by the Caribbean Regional Fisheries Mechanism (CRFM). Implementation partners will include, but not be limited to, CERMES, IFREMER, OECS,

WECAFC, national Fisheries Departments and fishing industry representatives. There will be a Project Committee comprising representatives from these agencies.

The CRFM will be accountable to the PRU for all funds and pilot project outputs.

6 Stakeholders and beneficiaries

Stakeholders are national governmental and regional intergovernmental management agencies, boat owners, fishers, vendors, processors, retailers, exporters and all persons engaged in associated support activities. Beneficiaries are all who earn a living, either in whole or in part from flyingfish as well as the consumers who will be assured a good supply of fish protein. Tourism will benefit from availability of a highly popular Caribbean seafood dish and countries will benefit from reduction in foreign exchange costs of importing seafood for local and tourism consumption.

7 Long-term sustainability strategy

The strategy for long-term sustainability is foremost to develop a process that is appropriate to the value of the resource and the capacity of the participating countries. It is envisaged that once the policy and management cycles have been established and operated, stakeholders will begin to appreciate their value and to recognize the benefits that can be derived. It is however, likely that it will take longer than two years for this to become self-supporting and that follow-on funding will be necessary for this to become established a fully-self supporting process. During the period of implementation, alternatives to direct government support will be explored. Discussions will be pursued with stakeholders to encourage them to supporting the processes required for transboundary management of flyingfish.

8 Replicability

The establishment of a functional policy and management cycle with appropriate linkages to national and local entities as well as to regional and global cycles will provide an example that can be adapted to other situations of shared fishery resources.

9 Monitoring and evaluation

A programme of monitoring and evaluation will be developed based on GEF indicators for resource status, governance processes and environmental pressures.

10 Cofunding

Partner	Role	In-kind	Cash
Caribbean Regional Fisheries Mechanism	Overall coordination of pilot project		
OECS	Coordination among OECS countries and technical input		
WECAFC	Ad Hoc Working Group on Flyingfish as a technical		

	forum		
CERMES	Technical inputs		
Countries	Participation in process and implementation of decisions		
Fisher organizations, vendors, processors/exporters	Participation in process		

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