5 THE FLYINGFISH FISHERY OF MARTINIQUE

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ABSTRACT

Flyingfish is the most important individual species group in the Martinican fishery, with 370 mt caught in 1987 (11.3 % of the total). The fishery operates on the west coast of the island, using gillnets and open boats powered by outboard engines. The fishery is seasonal, with virtually no flyingfish catch being landed between August and November, low catches in February and March and relatively high catches for the remainder of the year. In the southern landing sites, fishermen switch their activity between flyingfish and large pelagics. The flyingfish fishery is not limited by the resource, but by marketing problems, which leads the fishermen to limit their own catch. As a result, a project has been implemented at a central landing site to improve the landed value of flyingfish through processing (filleting and smoking).

1 DESCRIPTION OF THE FISHERY

1.1 Fishing techniques, past and present

The flyingfish fishery in Martinique is conducted from open boats ranging from 6 to 8 m in length and powered by outboard engines from 25 to 75 hp. Fishing trips last less than one day. The fishery is active only on the western coast (Caribbean coast) of Martinique (Figure 1), where a significant proportion of the boats are traditional dug-out canoes (gommiers), especially in the sites north of Fort-de-France (Guillou et al. 1988). A recent survey indicates that half of the boats in the fleet of the Caribbean coast are fiberglass (Gervaise 1990). On average, engine power is higher in the southern sector (Anses d'Arlets to Fort-de-France) than in the northern sector (Schoelcher to Grand-Rivière).

The main fishing technique used to catch flyingfish is the surface gillnet. Usually 2 or 3 nets are taken by each boat. A detailed technical description is given by Guillou and Lagin (in prep.). Gillnet mesh sizes range from 20 to 22 mm between knots, and the net is between 3 and 5 m high. The fishing process is described in three main phases by Gervaise (1990): Firstly, the water is baited with shark oil, bread, coconut and red flowers, in a zone where fish are seen, or around floating algae or objects. Secondly, one or two nets are set, often a large one (200 m in length) and a small one (50 m in length), while drifting with the wind. Thirdly, the net is hauled in when it begins to sink with the weight of fish, and another one is set while fish are removed from the first net.

In addition to nets, lines and scoops are said to be used, but these probably contribute negligibly to the total catch.

1.2 Fishing area and landing sites

The flyingfish fishery is active only on the Caribbean coast of Martinique, from Anses d'Arlets in the south to Grand-Rivière in the north (Figure 1). The main fishing grounds are located off the west coast of Martinique, in the Caribbean Sea. Although detailed data are lacking, it seems that the southern part of this area is more often visited than the northern part (Gervaise 1990). The channels separating Martinique from St. Lucia in the south, and Dominica in the north, are also fishing grounds for flyingfish, specially the

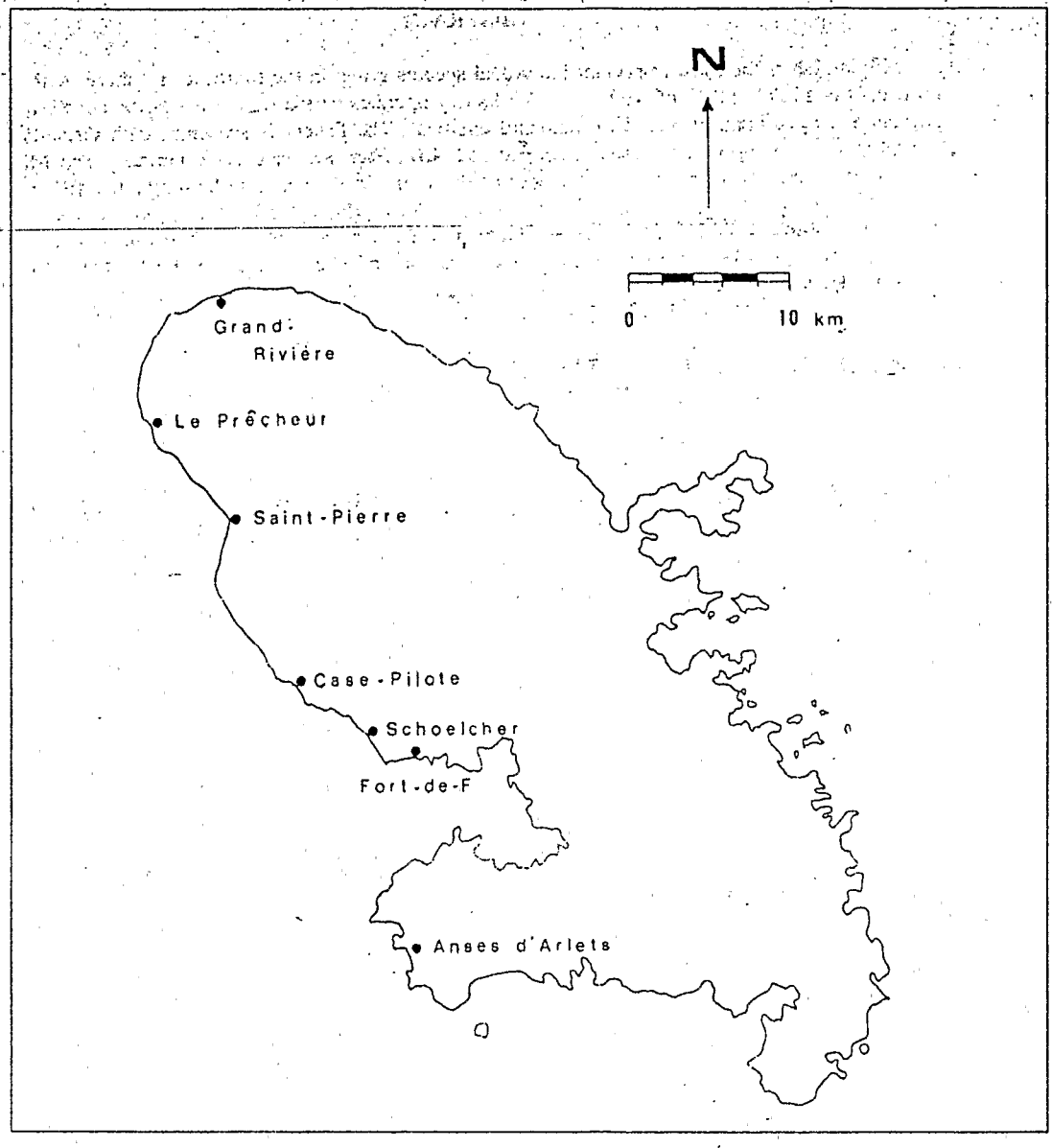

Figure 1. Main flyingfish landings sites in Martinique.

Dominica channel and the close Atlantic Ocean which are easily accessible to the fishermen from Grand-Rivière. Very little flyingfish fishing occurs off the east coast of Martinique, where the offshore fishery is primarily targeted at large pelagics (i.e. dolphin, wahoo and tuna).

The main landing sites for this fishery are Fort-de-France and Le Prêcheur where nearly 75 % of the flyingfish trips landed in 1987 (Gobert 1989). The importance of Fort-de-France as a landing site comes partly from the attraction effect of its market for boats of neighbouring sites. Le Prêcheur, which has a comparatively important fleet, also benefits from landings of fishermen coming from Grand-Rivière, where access to the main markets is difficult (Gervaise 1990). This landing pattern can be expected to change in the future owing to the implementation of a flyingfish processing facility at Case-Pilote, a site which is so far only of minor importance for flyingfish.

1.3 Estimated current flyingfish catch and effort

The quantities of flyingfish sold in the fish market of Fort-de-France have been recorded since 1971, but the decreasing importance of this marketing channel, as measured by the total sales and the number of merchants, makes it unsuitable to estimate the flyingfish production, or even its trends. However the average seasonal pattern of flyingfish records at Fort-de-France market is considered to be representative of that of the whole flyingfish catch.

From February 1987 to January 1988, intensive sampling was performed on fishing boats landing in the 25 most important sites, and the number of fishing trips only was recorded at the 106 remaining sites. The sampling procedure allowed estimation of the total number of fishing trips for each gear, the average fishing effort per trip and the average catch by species groups per trip (Gobert 1988). Although more emphasis was put on the nearshore components of the fishery sector, this study provides a better knowledge of the flyingfish fishery and the only precise catch and effort estimations to date (Gobert 1989).

The total annual catch of flyingfish was estimated at 370 mt. The fishery is clearly seasonal, with only very small catches of flyingfish being landed from August to November (Figure 2). In February and March 1987, the number of trips targeting flyingfish dropped sharply in the sites south of Fort-de-France and the offshore fishery turned to large pelagics, in response either to a decrease in average yields of flyingfish or to the appearance of large concentrations of large pelagics. This bi-modal pattern (high catches from December to January and again from April to July) is also apparent, although less marked, in the monthly data from Fort-de-France market, averaged over 20 years (Figure 3). Similar observations have been made in Dominica (Darroux and Oxenford 1986).

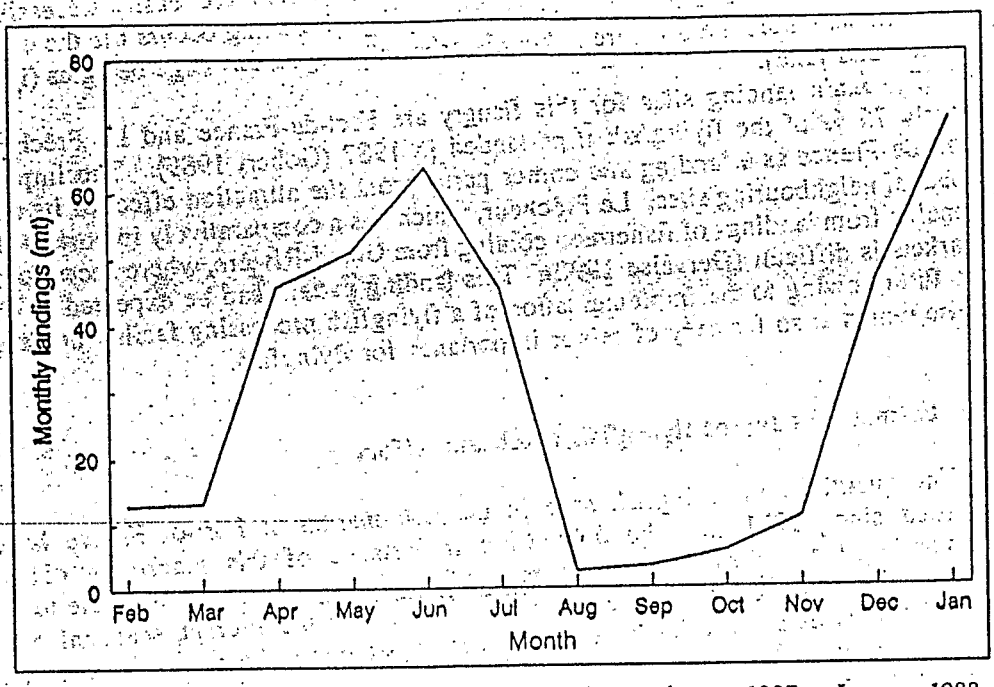

Figure 2. Monthly flyingfish catches for Martinique from February 1987 to January 1988.

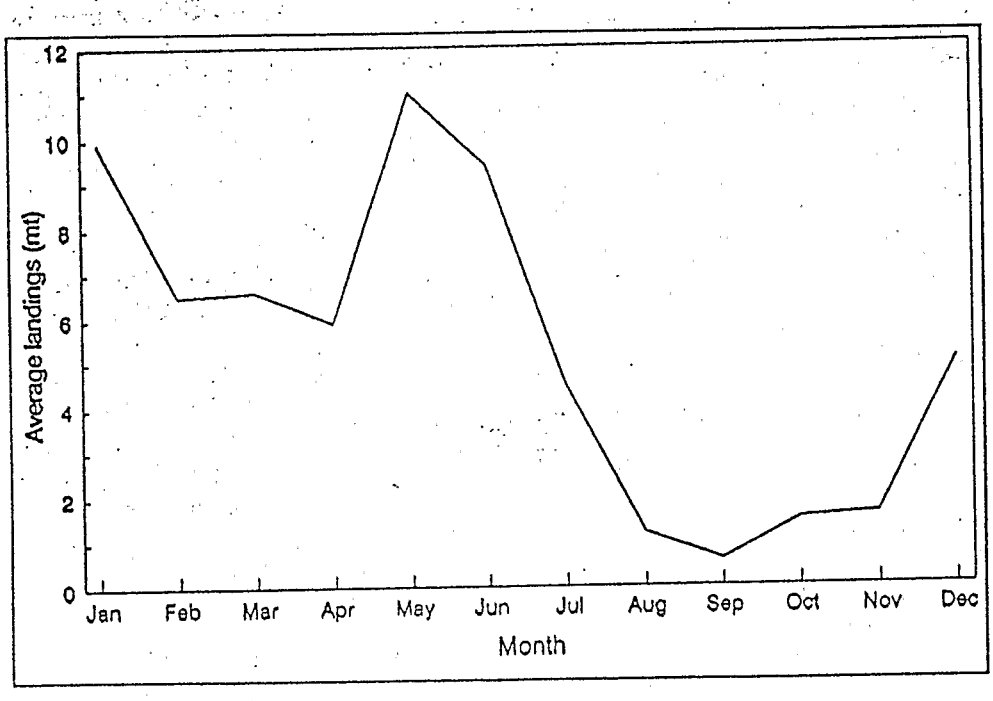

Figure 3. Average monthly sales of flyingfish in Fort-de-France fish market (1971-1991).

Estimates of fishing effort, measured as number of trips, are available only for 1987. Along the Caribbean coast from Anses d'Arlets to Le Prêcheur, a total of 4774 fishing trips targeted flyingfish. In addition, an estimated 600 fishing trips originating from other sites (particularly from Grand-Rivière) also targeted flyingfish. However, there are two important aspects to flyingfish-directed fishing effort which should be emphasized. Firstly, the flyingfish fishery is part of the offshore fishery called "pêche à miquelon", which also involves fishing for large pelagics with trolling lines. In the sites north of Fort-de-France, most of this offshore fishery is primarily targeting flyingfish, whereas in the sites south of Fort-de-France, fishermen appear to switch very easily from one type of fishing to the other. This is illustrated by the total stop of the flyingfish fishery at southern sites in March 1987, where the trips increased in number, but were all landing large pelagics (Figure 4). The second important aspect is the self-limitation of flyingfish catches, and thence of fishing effort targeting flyingfish. 90 % of 97 interviewed fishermen declared that they voluntarily limit their catches, and 70 % said they do so because of marketing problems. In general, fishermen estimate that they could catch 2 or 2.5 times more flyingfish than at present (Gervaise 1990).

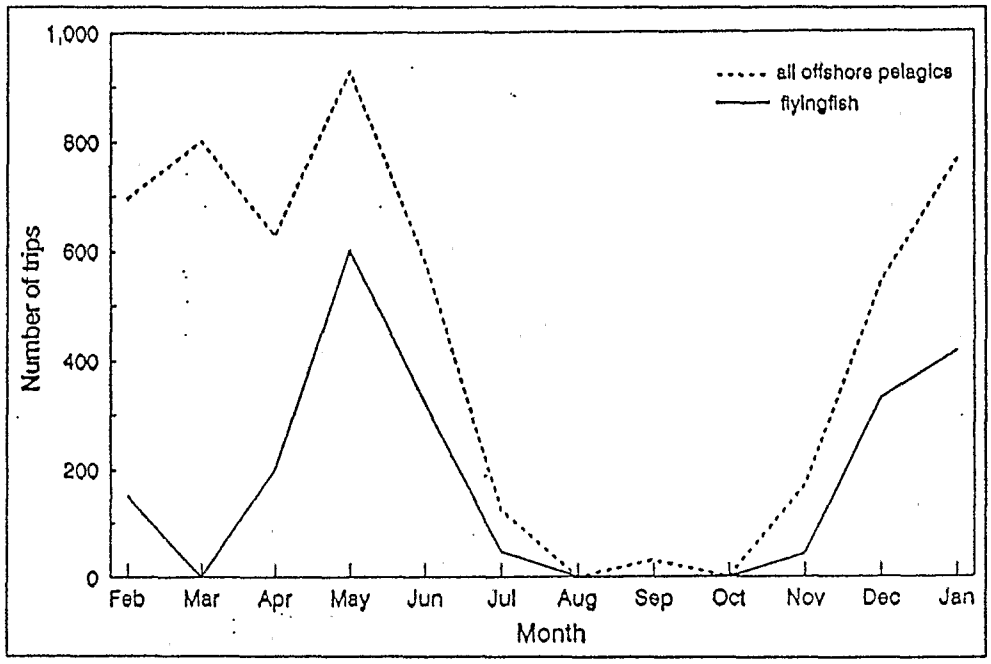

Figure 4. Total number of offshore fishing trips and number of fishing trips targeting flyingfish from the south Caribbean coast sites in Martinique from February 1987 to January 1988.

Average flyingfish catches for the landing sites south of Fort-de-France are 78.6 kg per trip, and for sites north of Fort-de-France are 38.4 kg per trip. This difference reflects differences in trip duration (which average 7.5 hrs for southern sites and 6.4 hrs for northern sites), and differences in engine power (which average 60.5 hp and 36.7 hp respectively). Boats from the southern sites therefore have greater searching time, and potential access to a larger fishing area than boats from the northern sites. The seasonal CPUE patterns in 1987 (Figure 5) indicate that fisheries in the northern and southern sectors are different, with a more traditional fishery in the north and a more innovative and efficient fishery in the south. In the north fishermen target flyingfish throughout the year, whilst in the south fishermen appear to target flyingfish only during periods of high concentration and target alternative species such as the large pelagics during the remainder of the pelagic fishing season, and set fish traps for demersal species between July and November.

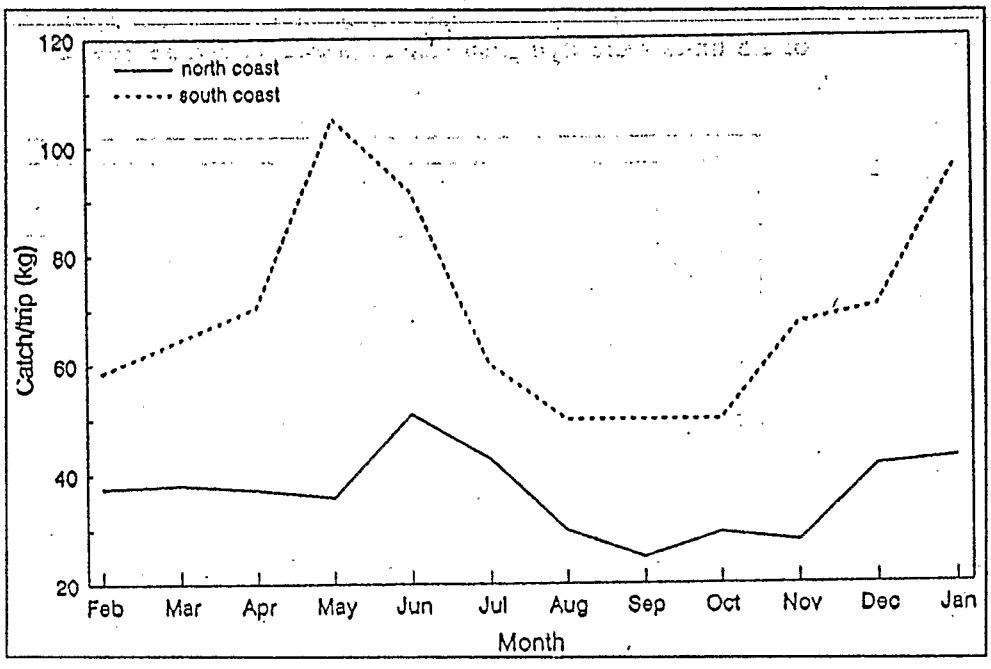

Figure 5. Average monthly flyingfish catch per trip data for the south and the north Caribbean coast sites, from February 1987 to January 1988.

1.4 Proportion of the total fish catch

Flyingfish represented 11.3 % of the total catch and 36.1 % of the offshore pelagic fishery ("pêche à miquelon") catch in 1987, making flyingfish the most abundant species group in the Martinican fishery. This latter proportion varied from 28 to 88 % for the whole island, without any marked seasonal pattern except in February and March where it was close to 10 %.

1.5 Landed value of the catch

No detailed information is presently available on the landing prices of flyingfish, but they are generally sold for around 15 to 20 F per kg. The overall value of the flyingfish catch is therefore estimated to lie between 5.5 to 7.4 million francs (approximately 1 to 1.3 million US $) per year.

1.6 Employment generated by the flyingfish fishery

There are no reliable data on the number of fishermen involved in the flyingfish fishery. There are probably very few fishermen, if any at all, who are entirely dependent on this resource, since flyingfish is only one of several important species taken by the offshore pelagic fishery, and its exploitation is primarily a seasonal activity, with the summer months being traditionally devoted to demersal fishing. The number of fishermen (boat owners and crew members) for whom flyingfish is an important relative source of income is at most a few hundred.

The catch is sold either by fishermen or, more often, by merchants. There is no information on the number of these intermediaries, most of whom probably do not sell only flyingfish. A processing plant is presently being set up in Case-Pilote, which should allow flyingfish landings in the northern sector to concentrate at this site, for filleting and smoking. A total of 25 employees are expected to work in this project.

1.7 Flyingfish species composition and size structure of the catch

Owing to the wide scope of the study undertaken in 1987, and to the fact that the flyingfish fishery is not limited by resource-related factors, little sampling effort was devoted to these species at the detailed level of species composition and length-structure of catches. When identified, the dominant species was *Hirundichthys affinis*. A larger species sometimes found in the catches is *Cypselurus cyanopterus*, locally called "codène". The selectivity of the gillnets used in the fishery did not allow the observation of any modal progression of the length structures. All fish measured were between 23 and 29 cm in total length.

2 DEVELOPMENT AND MANAGEMENT OF THE FLYINGFISH

FISHING INDUSTRY

2.1 Catch and effort data collection system

There is no specific data collection system for flyingfish. Since 1990, a professional organization ("Comité des Pêches") runs a routine data collection system on the whole fishery sector of the island (Franeil et al. 1991). Data are collected according to a sampling scheme designed to provide the most precise estimation of total catch given the available manpower (one agent only), and based on activity sampling (number of trips per gear) through interviews with fishermen, and trip sampling at the main landing sites (recording of catch and effort). Owing to the recent implementation of the system, no report has been published so far.

2.2 Recent fishing agreements and negotiations

There is no specific fishing agreement involving the Martinican flyingfish fishery with any of the neighbouring islands. However, there are agreed maritime boundaries between Martinique and the islands of St. Lucia ("Décret 81-609", May 1981) and Dominica ("Décret 89-302", May 1989).

2.3 Recent legislation pertaining to flyingfish

There is no legislation applicable to the flyingfish fishery other than the general rules applicable to all types of fishing activities.

2.4 Planned future directions for the industry

In Martinique there is little or no possibility of further development of the demersal fishery, whose products are highly prized, whereas marketing problems limit the catch of pelagic species which probably can withstand more fishing effort. Furthermore, the fishing activity along the northern Caribbean coast of the island has been steadily decreasing for many years. This situation lead the "Comité des Pêches" to study, and then implement a project for a processing facility located in a central site where the flyingfish landings could concentrate (Gervaise 1990). The village of Case-Pilote was chosen because it already has some harbour infrastructure and because of its central position relative to the other fishing villages in the northern sector.

The processing plant will generate 25 jobs, and is expected to process around 200 mt of flyingfish yearly into several types of products including fresh or frozen flyingfish fillets, whole or filleted smoked flyingfish, and ready-to-cook flyingfish preparations. Other pelagic species in addition to flyingfish will also be processed at the plant. About one third of the capital of the firm will be owned by the fishermen themselves.

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