

The flyingfish fishery of Dominica

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Abstract: Flyingfish (primarily *Hirundichthys affinis*) is a mainstay of the pelagic fishery in Dominica. On average flyingfish catches represent about 12% of the total pelagic landings. Although a decline in the flyingfish catches occurred in the late 1980s, the annual catches have shown a marked increase over the last two years, which gives an indication of the fishery's potential for expansion. The fishery remains unmanaged.

DESCRIPTION OF THE FISHERY

Fishing techniques, past and present

The flyingfish fishery is a traditional one in Dominica. The fishing techniques for this species have not changed over the years, except for the introduction of surface gillnets. The fishing fleet was traditionally sail-powered, but over the last two decades, outboard motors have been introduced. The outboard motors presently in use in the industry range in size from 10-115 hp. Oars and sails are still in use as auxiliary means of power.

The fishing fleet in Dominica at present comprises approximately 850 boats. These include open, wooden, keel boats (3.7-5.5 m), primitive dugout canoes (4.9-7.6 m), open, dory type FRP pirogues (5.8-7.6 m) and similar marine-plywood pirogues (6.7-9.1 m). There are also two overnighting vessels with a sea-going duration time of 7-10 days. However, only 40% of the total fishing fleet (340 boats) is actively engaged in the flyingfish fishery. The two overnighting vessels do not target the flyingfish resource, and a large number of the smaller fishing vessels do not have the capacity to venture far enough offshore to target flyingfish and are instead involved in beach seining activities.

Flyingfish boats generally venture to sea either in the early morning or in the mid afternoon and head for fishing grounds between 5 and 24 km from shore. Long-established fishing grounds are known to fishermen by landmarks. The presence of flocks of birds or floating objects serve to indicate to fishermen the exact location of schools of fish on the fishing grounds.

On reaching the fishing grounds, fishermen position themselves at strategic positions in the vessel,

usually one crew member in the bow, one in the centre and one in the stern. Each person typically has a specific task to perform, which may involve setting the fish attracting device (FAD), attending to the "chum" or setting the net. Firstly, the FAD which comprises a floating raft of dried leaf trash (either coconut palm fronds or banana leaves) is thrown over the side into the water and is tethered about 6-9 m from the vessel. Then the process of "chumming" takes place, which involves throwing macerated flyingfish or other small pelagics and fish oil (usually shark oil) over the windward side of the boat to calm the sea and attract the flyingfish.

Several different methods (gillnet, dip net, and hook and line) are used to actually harvest the fish. If the gillnet method is to be used, the net is then set, either tethering it close to the boat or on a line up to 50 m away. As fish are attracted by the chum, they come into contact with the gillnet. There are several different mesh sizes of gillnet being used in the fishery. The mesh size to be used may be chosen according to the mean size of fish gathering around the boat, or may be chosen according to the time of year or the area being fished, although there is no evidence that different areas in Dominica have different sized flyingfish. Sometimes more than one gillnet is fished simultaneously, or a second gillnet of similar mesh size may be set whilst the first one is picked clean of flyingfish and flyingfish eggs. If flyingfish are particularly abundant one or two fish are caught by hook and line and then these live fish are tethered close to the boat and used together with the FAD and chum to attract others. As fish gather, so the FAD is hauled alongside the boat and a handheld dip net (known as a "calley") is used to scoop up the fish. The dip net has a wood or split bamboo frame to which small mesh netting with a conical shaped closed end is

attached. As an alternative to using tethered live fish, a less popular method is to fix a dead flyingfish with its wings fully stretched, to the edge of the dip net as it is held under the water.

Fishing area and landing sites

The fishing grounds for flyingfish are between 5-24 km from shore. The distance from shore at which flyingfish are found however, varies with time of year and with the direction and magnitude of ocean currents. Furthermore, fishing vessels on the windward (east) coast are bigger than those on the west coast, and tend to venture further offshore to target flyingfish than those on the leeward coast. Flyingfish are most commonly harvested in the channels between Dominica and Martinique to the south, and between Dominica and Gaudeloupe to the north. Periodically, flyingfish are caught off the east coast and southeast of the island in the vicinity of the Macouba Bank.

There are a total of 42 fish landing sites around the island, and flyingfish are traditionally landed at 12 of these (Table 1). The relative quantity of flyingfish landed at these sites may vary considerably in some months when rough seas at some locations prevent boats from launching.

Landing sites are classified as Primary, Secondary or Tertiary sites, depending on the facilities available (Figure 1). The facilities at most landing sites are minimal, and in the majority of cases, landing sites only have wooden sheds constructed by the fishermen themselves.

Estimated current flyingfish catch and effort

Flyingfish are recorded by the number of baskets or dip net loads landed. Baskets hold approximately 500 fish or 45 kg (100 lb), and dip nets hold about 125 fish or 11 kg (25 lb).

In 1984 and for part of 1985 flyingfish landing records were collected from 32 of the 42 landing sites. The annual total recorded weight of flyingfish from these sites in 1984 was 129,795 kg (285,549 lb) and for 1985 from January-August was 90,750 kg (199,651 lb). These records are believed to represent about 65% of the actual total weight landed in Dominica at that time. Total landed weight of flyingfish was therefore around 150-200 mt per year. Since 1987 flyingfish landing data have been collected from 8 representative landing sites. These include a cross-section of the three categories of landing sites in the island. At present a total of 16 landing sites are visited by 11 fishery data collectors. A

summary of catch records is given in Table 1. These landing records are estimated to represent about 55% of total flyingfish landings at these sites.

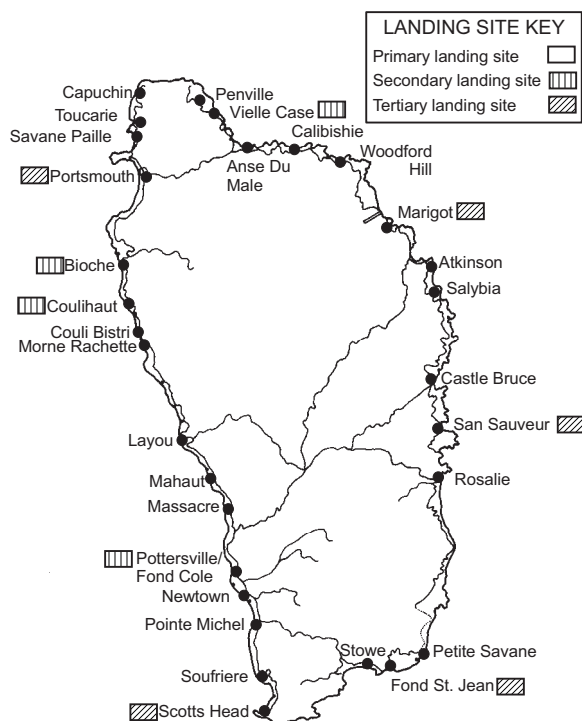


Figure 1. Map of Dominica showing Primary, Secondary and Tertiary landing sites.

Table 1. Summary of flyingfish landings recorded at selected landing sites in Dominica.

Landing site	Landed weight (kg)			
	1987*	1988	1989	1990
Fond St. Jean	571	12,197	619	7,015
Bioche/Dublanc	935	1,242	87	1,710
Colihaut	-	419	760	6,337
Layou	-	6	7	120
Marigot	938	9,415	2,502	7,760
Newtown	-	-	6,038	18,290
Portsmouth	150	1,053	37	2,543
Pottersville	-	-	4,941	7,250
San Sauveur	-	-	9	436
Scotts Head	495	2,423	646	3,713
St. Joseph	-	-	2	91
Mahaut/Massacre	-	-	-	33
Recorded total	3,089*	26,755	15,648	55,298
Estimated actual total	5,616*	48,645	28,451	100,542

* Data incomplete since sampling only commenced in November of 1987.

This subsample of landing sites is believed to represent about 65% of the total landed at all 42 landing sites around the island. Crude estimates of total landings of flyingfish for Dominica based on the above assumptions are given in Table 2.

Despite recent declines in catches there is evidence of a steady increase in flyingfish landings (Table 2), which reflects an increase in fishing effort. The total flyingfish production in 1989 was lower than the previous year as a result of Hurricane Hugo which adversely affected fishing effort.

Table 2. Estimated total landings of flyingfish for Dominica in metric tons.

1987	1988	1989	1990
8.6	74.8	43.8	154.7

Proportion of the total fish catch

Flyingfish is still the most important species by weight, landed by the artisanal fishery in Dominica. In 1984 the flyingfish catch was 3.5 times greater than the second most abundant species (dolphinfish) in the artisanal fishery catch. At that time flyingfish was estimated to account for 40% of the total fish catch by weight and 58% of the pelagic catch.

Economic value of the catch

There is no enforced price control on the sale of fish in Dominica. The strategy is to allow the supply and demand to dictate prices. Flyingfish is currently sold by fishermen directly to the consumer for around EC\$ 11 per kg (EC\$ 5 per lb). Hence the flyingfish fishery is therefore estimated to be worth in excess of EC\$ 1 million annually to fishermen (1988: EC\$ 822,800; 1989: EC\$ 481,800; 1990: EC\$ 1.7 million). The demand for fish on the island is very high such that gluts are hardly ever experienced and fishermen rarely have problems selling their full catch. However, lack of storage facilities at the landing sites does constrain the amount of time fishermen can stay at sea, since they must sell their catch the same day.

Boning of flyingfish is a practice, which has the potential to expand into a big business amongst the womenfolk and the fishermen's groups. There is a high demand for boned flyingfish, particularly in the hospitality industry. There are currently two fisheries co-operatives, which are equipped for commercial fish boning, one of which has invested in blast freezer

facilities. There are also two women's groups with similar interest.

Employment generated by the fishery

There are an estimated 2,200 fishermen engaged in the fishing industry of which about 600 are full-time. The rest are part-time fishermen who share their time between agriculture and fishing. Over 90% of the full-time fishermen (>1980 fishermen) and a significant number of the part-time fishermen harvest flyingfish.

A number of other persons are employed directly by the flyingfish fishing industry. These include "middle-men" whose services are occasionally engaged to distribute large catches by vehicle to other markets. There are several fishermen's co-operatives and fisheries groups, most of which are involved simply in the harvest of fish. However, there are two or three which are also in marketing. In these cases, fish is transported from the rural communities to the populated urban centres or to the banana belts where the residents have good buying power.

Flyingfish processing has potential to expand with the expansion of the hospitality industry. There is certainly interest from community groups in small villages, which recruit young men and women in boning flyingfish on a commercial scale for this industry. This would create employment for a substantial number of additional persons.

The flyingfish fishery also supports a very old "cottage-industry" in Dominica, whereby women bulk purchase flyingfish, soak them in brine to preserve them and then sell them to villagers. In some communities flyingfish are also smoked and sold.

Other types of employment associated with the flyingfish fishery and requiring special skills include boat building, construction of dip nets, and repairing the fishing gear. The services of older fishermen are normally tapped for these latter two. There is a tradition in some fishing centres that only keel boats are used and all of these are built by the local community. Other centres use only canoes and these too are locally built. The marine plywood and FRP boats are normally purchased from Martinique or Guadeloupe.

Species composition and size structure of the flyingfish catch

Several species of flyingfish are found around Dominica. However, only one species (*Hirundichthys affinis*) is of major commercial importance. *H. affinis* is locally known as "volant", is found offshore and has a

bimodal pattern of seasonal abundance. The large individuals of this species which are found in the months of January and February are known as “volant janvier” (January flyingfish). Occasionally this species may also be caught quite close to shore in moderately large schools and are referred to as “volant lacote” (coastal flyingfish).

A larger flyingfish, *Cypselurus cyanopterus* known locally as “den”, also occurs offshore, but less frequently than *H. affinis* and is most often caught by hook and line.

A third species, which is much smaller (probably *Parexocoetus brachypterus*) and known locally as “petite volant” (small flyingfish) is found in nearshore waters, but is not targeted by commercial fishermen, on account of its size.

DEVELOPMENT AND MANAGEMENT OF THE FLYINGFISH INDUSTRY

Catch and effort data collection system

At present, catch data (including that of flyingfish) are collected at 16 landing sites by 12 persons. In certain areas such as Marigot, Fond St. Jean and San Sauveur, data collectors record total landings of all boats each day from Monday to Friday. In other areas a sub-sample of landing data are collected by randomly selecting vessels entering the bay and then carrying out a complete census of catches landed by these boats.

Recent fishing agreements and negotiations

There are presently no fishing agreements in place between Dominica and neighbouring territories, regarding access to the flyingfish resource.

Recent legislation pertaining to flyingfish

There is no fisheries legislation pertaining specifically to flyingfish, and the pelagic fishery, of which flyingfish is a major component. It remains a free-access, unmanaged fishery.

Planned future directions for the industry

A potential for marketing greater quantities of flyingfish in Dominica is recognised. Even though the per capita consumption of fish is low (compared with the world average) approximately EC\$ 4 million worth of fish (some fresh, but most salted or canned) is still imported annually.

It is hoped that the annual flyingfish yield will be further increased over the next few years. This will be encouraged by the provision of more infrastructural development at landing sites, and more sea worthy boats. Freezer storage space will be provided at the main landing sites and distribution facilities improved to handle temporary surpluses in peak abundance months.

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