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**STATUS OF THE DEEP BOTTOM FISHERY AROUND EFATE IN 1987 AND IN 1988**

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SUMMARY

After four years of exploitation, the yields of the deep bottom fishery around Efate are of 0.91 kg per fishing trip hour per reel. Etelis coruscans; Etelis carbunculus; and Pristipomoides multidens are the main north west of Efate, and in 1988 an expansion of the fishing effort was witnessed in the south west areas and particular in Lelepa. In this region, the catch per unit effort (around 1 kg per hour trip and per reel) was marginally higher than the average of 0.9 kg per trip hour per reel observed on Efate. For 1988, the Village Fisheries Development Program (V.F.D.P.) associations declared 78% of their sales to the Port-Vila's fish market. The total deep bottom fishery production is estimated at approximately 50% of the M.S.Y.

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## 1. Status of the Efate's deep bottom fishery

Efate island includes the biggest urban center of Vanuatu, namely Port-Vila, and as such, has a high demand for commercial sales of fresh fish. The target species of the deep bottom fishery are the Lutjanidae family and are commonly referred to as snappers. Therefore the fishermen who operate in the deep bottom fishery, benefit from a privileged commercial situation created by the high demand for fresh quality fish from the local fish market, hotels and restaurants.

Two commercial fisheries cohabit in Efate. The first is a structured fishery established in 1983 by the V.F.D.P. (Village Fisheries Development Program) and organized in fishermen associations. The second is composed of an informal and uncontrolled fishery consisting of private fishermen using private boats, which mainly sell their catches directly to the hotels and the restaurants. The V.F.D.P. associations sell compulsorily their catches to the local fish market "Natai".

## 2. Methods of fishing activity and statistics records

As most of the structured fishing projects set around the Pacific (CROSSLAND and GRANDPERRIN, 1980), fishing equipment comprises of vessels of 5 to 6 meters long, powered by 25 h.p. outboard motors and supplied with two or four handreels. Each line is fitted with 3 hooks and a 2 kg weight. The fishing occurs with the motors stopped and the boat anchored above the deep bottom fishing place.

The V.F.D.P. associations can benefit from cheap fuel (reduced duty) if they provide the Fisheries Department with information about the trip's duration, the fishing depth and area, the number of reels in use, the amount of catches and their sales and expenses. In addition the ORSTOM (Institut Français de Recherche Scientifique pour le Développement en Coopération) gives 50 Vatus when the lengths of the fishes are also recorded. All this

informations are recorded on forms for future statistical analysis.

Efate has been divided into eleven fishing areas (Figure 2). During a fishing trip, the fisherman can make several fishing sessions at different places in the same area. Because of the difficulties in determining the actual fishing time due to the lack of information on time spent fishing or in transit from one fishing location to another, we have used a unit of fishing effort as the number of trip hours per reel.

### 3. Analysis of the informations provided by the Efate's V.F.D.P. associations.

Between January 1987 and December 1988, eleven associations declared 367 trips during which 18,059 kg of snappers were caught using a fishing effort of 19,742 reel trip hours. The average catch is 49.2 kg per trip with a yield of 0.91 kg per trip hour per reel.

The average catch per trip is similar to those obtained in New Caledonia, but they are 2 to 4 times less than the average catches of Papua New Guinea, Fiji and the American Samoa (Table 1). The catches per unit effort in 1987 and 1988 are the same as those observed in Efate in 1986 (SCHAAN and al., 1987).

In 1987, 74% of the total number of fish caught comprised of deep water snappers; Etelis carbunculus (18.2%), Etelis coruscans (14.3%), Pristipomoides multidens (26.4%) and Pristipomoides flavipinnis (15.3%) (Figure 1). In 1988, the same species except for Pristipomoides flavipinnis composed about 69% of fish caught. Apart from the decrease of the proportion of Pristipomoides flavipinnis, the specific composition did not show any significant change over that recorded for (SCHAAN and al., 1987).

### 4. Fluctuations in the fishing effort and in the catches between different fishing areas around Efate

Figures 2a and 2b respectively show for 1987 and 1988 the level of the fishing effort and the catches per unit effort for each area. It clearly appears that the fishing effort concentrates in the north east Efate (Malo and Forari). In 1988 fishing effort increases were recorded in Lelepa and in the south west of Efate.

The catch per unit effort was very similar in most areas. They are marginally higher in Lelepa and in Toukoutouk, approaching the 1 kg per trip hour per reel. The lowest catches per unit effort are made in the south of Efate, around Teouma and Bay of Enam, but as very few trips were made in these areas, we cannot make conclusions about the

Table 1 - Catches per trip obtained in some Pacific islands

COUNTRIES	PERIODS	CATCH IN KG/TRIP	REFERENCES
AMERICAN SAMOA	23/03 to 2/07 1978	84	MEAD P.-1978
NEW CALEDONIA	9/04 to 3/09 1979	41.4	FUSIMALOHI T. R.GRANDPERRIN- 1979
PAPUA NEW GUINEA	5/09 to 14/12 1979	157.3	FUSIMALOHI T. J. CROSSLAND - 1980
FIJI	8/11-13/12 79 13/03-1/09 80	147.4	MEAD P. - 1980
EFATE	1987-1988	49.2	This study

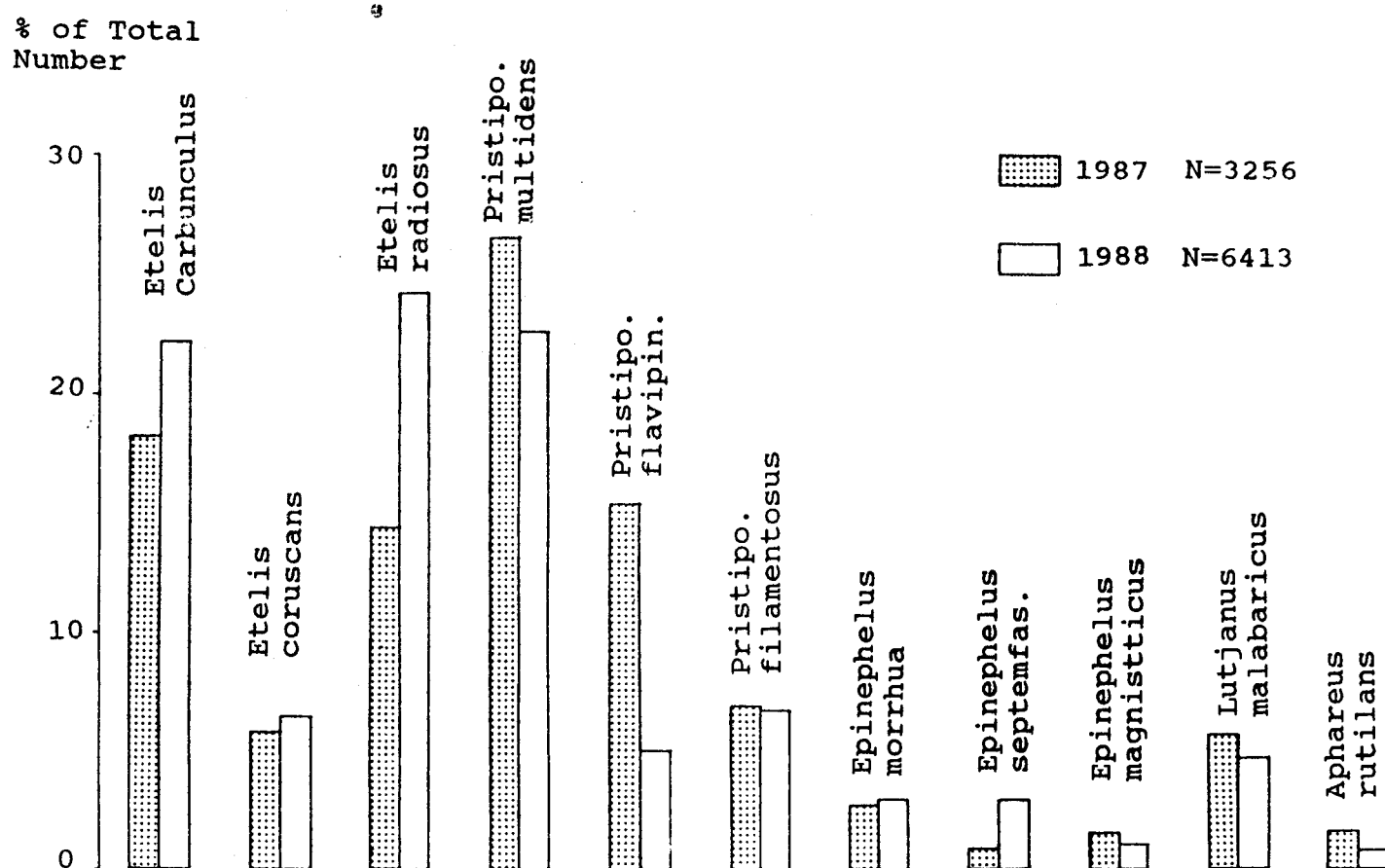


Figure 1 - Proportions of eleven benthic species in the total number of catches.

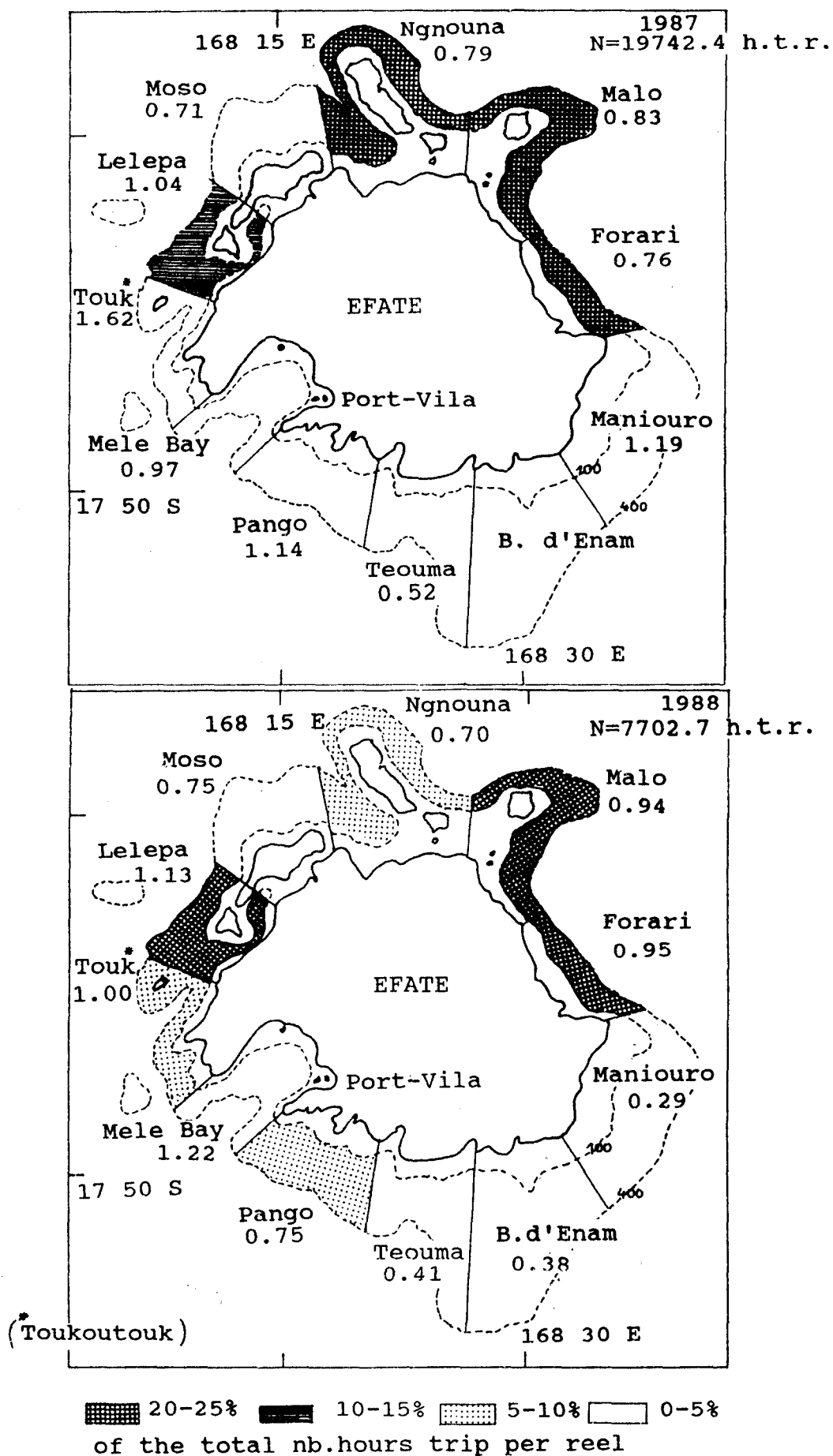


Figure 2 a and b- Distribution of the fishing effort and the catch per unit effort around Efate in 1987 ( Fig.1a) and in 1988 (Fig.2b).

potential production from these areas. The intensive fishing activity in Malo and Forari does not seem, on figures collected to date, to have a negative influence on the catch yields.

#### 5. Attempt to estimate the actual production of deep bottom fish in Efate

Two reasons lead to think that the V.F.D.P. production's declarations underestimates the real production:

- all the V.F.D.P. associations do not fill forms,
- some V.F.D.P. associations do not systematically declare their catches.

As each V.F.D.P. association should sell their catches to the local fish market "Natai", we can evaluate the total production of the V.F.D.P. fishing associations, by examining the purchases made by "Natai". In 1988, "Natai" bought 14,352 kg of bottom fish from the Efate's associations. However for the same year, the associations declared 11,268 kg in the statistics forms. This therefore means that the information supplied by the associations to the V.F.D.P. under record production by at least 22%..

We have also estimated the total deep bottom fishery production including with the V.F.D.P. activities, the production of the private commercial fishery. In 1988, about 7 boats were estimated to be operating in the deep bottom fishery around Efate (FYRIAM, pers. comm.). On the basis of 49 kg per trip and 100 trips per year, the production of these vessels is calculated to be 34,400 kg per year. Added to the "Natai"'s purchases, the total deep bottom fishery production for Efate is estimated at 48,800 kg for 1988. Considering the Maximal Sustainable Yield for Efate is 98,200 kg (estimated on the basis of the 1 kg per hectare between 100 and 400 meters contour (BROUARD and GRANDPERRIN, 1984)), this would represent about 50% of the potential production from the deep bottom fishery in Efate.

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