

EAST AFRICAN COMMUNITY

**EAST AFRICAN FRESHWATER
FISHERIES RESEARCH
ORGANIZATION**

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The biannual seasonality of rainfall in some areas of Lake Victoria has been implicated in the bimodal fluctuations in catches of certain fish species. An experimental sampling pattern for studying this temporal biological phenomenon would be made up along with studies in active gears.

As the trawlers were not fully operational due mainly to mechanical problems, sampling has therefore reduced and much time was then spent on the beach seine surveys.

An attempt was made to visit all possible beach seining sites which could be reached by road or foot on the mainland. Sampling sites were selected in each of the limnological zones where biological data from the commercial beach seine catches will be collected quarterly.

Regions visited covered the entire Tanzania coast of Lake Victoria from Uganda to Kenya. They included the Bukoba Region (Uganda to Emin Pasha Gulf), Mwanza Region (Emin Pasha Gulf to Speke Gulf), and the Mara Region (Speke Gulf to Kenya). The islands of Ukerewe and Ukara were also included in the survey of beach seining sites.

An early observation was that very few commercial beach seines were in use on the Tanzania coast of Lake Victoria in the last quarter of 1973. All had 1" mesh and were almost exclusively fished on sandy bottoms. Almost no breeding or brooding *Tilapia* were seen in the catches.

No *Tilapia* less than 100 mm in total length were taken but probably many of *Tilapia* caught were immature. Beach seining was very unproductive in the Bukoba area but good catches of *Tilapia* were made in the Bihamulo District (Emin Pasha Gulf). Near Musoma results were good for *Bagrus* but only fair for *Tilapia*. Most *Tilapia* taken at all locations were *Tilapia esculenta*.

3. FISHERY STATISTICS

3.1 PATTERNS IN THE CATCH RECORDS FROM THE KENYA AREA OF LAKE VICTORIA

Soon after his arrival at the Kisumu Substation, Dr. G. Marten started detailed analysis of post records of fish catches from the Kenyan segment of Lake Victoria initially for the period 1968 to 1973. It is well known that catches inside Nyanza Gulf are generally lower than those outside the Gulf. This is particularly so for fish which have nearly disappeared from the Gulf in recent years, such as *Barbus*, *Labeo*, *Mormyrus*, *Schilbe*, and *Synodontis*. In fact, catches of *Labeo*, *Mormyrus*, *Schilbe*,

and *Synodontis* are very low even in the Uganda-Wanyama-Wichlum region, which is adjacent to the Gulf but not inside it.

Perhaps not so well known in the fact that catches of the fish predators, *Clarias* and *Bagrus* on the one hand and *Protopterus* on the other, tend to complement each other on a regional basis. Catches of *Clarias* and *Bagrus* are about ten times as high per boat at the Northern landings outside the Gulf (Marengo to Wichlum) as they are at landings inside the Gulf. Catches at Karungu, outside the Gulf on the South, are nearly as low as in the Gulf.

Protopterus shows the reverse, with catches inside the Gulf about ten times as great per boat as immediately outside the Gulf. Whereas catches of *Bagrus*, *Clarias* and *Protopterus* in the Gulf have been roughly the same over the past five years, *Clarias* and *Bagrus* have been replacing *Protopterus* at the Northern landings during the same period. That is, catches of *Clarias* and *Bagrus* have been increasing steadily where they are already high, and catches of *Protopterus* are continuing to decline where they are low.

Tilapia esculenta has been declining steadily at all landings, the *Tilapia nilotica* decline being most advanced in the Gulf (plus Karungu). *Tilapia variabilis* and *Tilapia nilotica* have been increasing steadily, but not sufficiently to compensate for losses of *Tilapia esculenta*. The increase in these two species is most advanced at the northern landings outside the Gulf.

Catches of *Bagrus*, *Mormyrus*, *Labeo*, *Clarias*, and *Schilbe* have an annual cycle with a peak in January or February. The first three species have a second annual peak in August or September. *Synodontis* and *Tilapia esculenta* also have two peak catches a year, but the first is in March and the second in September or October. For all the fish these peaks by no means turn up in all years. In fact the seasonal pattern of catch at different landings during the same year is typically quite different. Only adjacent landings show peaks at the same time and then only on some occasions.

Catches of *Tilapia variabilis*, *Haplochromis* and *Protopterus* have fluctuations with a period of five or nine months. Because their periodicities are not built around an annual cycle, they do not consistently show peaks at the same time of the year. However, fluctuations in *Haplochromis* and *Tilapia variabilis* tend to be associated with fluctuations in *Tilapia esculenta*. Sometimes they fluctuate together and sometimes *Tilapia esculenta* is low when the other two are high. Fluctuations in catches of *Protopterus*

tend to go together with those of *Clarias*, *Bagrus*, and *Schilbe*, suggesting that the fish predators may be fluctuating as a group.

It should be noted that the above patterns in catch fluctuation do not generally hold for the northernmost landings outside the Gulf (Marenga and Usenge), where periodicities may be absent, or if they are present, peaks are at different times of the year from those in the Gulf. For example, peak catches of *Tilapia esculenta* in the north come in June and July, the time of lowest catches elsewhere.

Although there are conspicuous fluctuations in the numbers of boats at each landing, the fluctuations surprisingly show no periodicity, annual or otherwise.

3.2 CORRELATION PATTERNS IN IBIS TRAWLING (1969—1971)

Factor analysis was applied to the IBIS bottom trawling data on Lake Victoria to discover which fish species were similar to each other with respect to the circumstances in which they were caught. These were no simple groupings, but the *Tilapia* and large fish predators (*Bagrus*, *Clarias*, *Protopterus*) tend to be similar by being caught more effectively with large condenses in shallow water during the rainy season at night. *Haplochromis* and *Synodontis* were the opposite. *Schilbe* and *Barbus* tended to be caught during the daytime.

Tilapia catches were most strongly associated with the full moon, while *Haplochromis* and *Protopterus* had a weaker association with the full moon. *Mormyrus* and *Schilbe* catches were strongly associated with the dark of the moon, while *Clarias* and *Lates* had a weaker association with the dark moon.

One interesting result was that a longer duration of haul (18° minutes as opposed to 3° minutes) did not improve the catch per haul of many species. Only *Bagrus*, *Clarias*, *Schilbe*, *Synodontis*, and *Protopterus* had larger catches in longer hauls.

VISITORS

EAFFRO continued to enjoy good public relations as estimated by the large numbers of visitors both to the Headquarters of the Organization in Jinja as well as in the Substations in Kisumu and Mwanza. Notably, the Community Service Commission led by Mr. W.Y. Nega spent a useful day in January at EAFFRO whilst a team from the East African Development Bank led by Mr. Watibini Manda visited several times to discuss aspects concerned with setting up of Fishmeal plants in

East Africa. Co-operation with Makerere University was well maintained and the Professor of Zoology regularly visited EAFFRO for consultations. EAFFRO was greatly honoured by the visit of the Hon. Minister of Transport, Hon. J.J. Obbo. Similarly, EAFFRO was privileged and honoured by the visit of Hon. Dr. Robert J. Ouko, East African Community Minister for Common Market and Economic Affairs in December.