

Barramundi Tagging Programme

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Fisheries scientists at the Department of Agriculture, Stock and Fisheries are concerned at rumours in the fishing industry that barramundi are being "fished out". Some fishermen have claimed that their catch rates are declining around Daru where fishing pressure is heavy. Barramundi have been taken in fewer numbers in Lake Murray during recent years, and this has also caused some anxiety in the industry. These fears may be groundless, according to a visiting specialist from the World Bank, Mr C. Beaver, who visited the area during June, 1968. In fact, it may well be that the barramundi stocks could stand a much greater fishing pressure. In March, 1970 the Department began an intensive study of the barramundi and the barramundi fishing industry. The biology, life history and population dynamics of this fish will be studied to enable the Department to recommend a management programme for this important industry.

Tagging

INITIALLY, biologists will concentrate on tagging barramundi in the fishing areas. Fish are collected in set gill nets and seine nets, weighed and measured, then a tag is fixed to the gill plate and the fish is released. Several years ago, fisheries officers released three to four hundred tagged barramundi around Daru, but none of these tags was ever recovered. In the present programme many more fish will be tagged, and over several years biologists hope that several hundred tagged fish will be recaptured. A target of 1,000 tagged fish has been set for the first year, and in the next three to four years about 4,000 fish will be tagged.

Fisheries officers have talked about the tagging programme in radio interviews, and posters in English, Pidgin and Motu have been circulated. The fisherman is asked to measure any tagged fish he catches, remove the tag and take it to the nearest D.A.S.F. officer or mission. He will be given 50c for every tag he brings, provided he gives the following information:—

- (i) Where the fish was caught;
- (ii) The time and day the fish was caught;
- (iii) How it was caught; and
- (iv) How long it was.

Only the tag has to be given to the agricultural officer; the fisherman keeps the fish.

This information will show how far the fish has travelled since it was released, and how much it has grown.

Tagged fish are being released mainly around Daru, where the main part of the commercial fishery is, but tagging operations will be extended to fishing areas all along the coast.

At the same time, commercial fishermen are being asked to supply data on their total catch. From the proportion of tagged fish occurring in the catch, researchers will be able to estimate the size of the barramundi population, and the fishing mortality. Sampling tests by field officers will supplement data from commercial catch returns.

Under the present fishing regulations, there are no controls on commercial barramundi-fishing activities. There are no limits on the quantity of fish which may be taken, or how or where they may be caught. There are no size restrictions, nor are there any limits on the duration of the fishing season. The question researchers have to answer is, are sufficient numbers of barramundi escaping from the fishermen and other predators to maintain breeding stocks? If not, some regulation will be necessary.

Biologists need much more information about the barramundi, before they can recommend adequate management measures. It is very important to know where and when the fish breeds, and if necessary to limit fishing pressure during part of the breeding season.



Plate I.—Special pliers are used to attach the tag to the gills of the fish (Photo: D.I.E.S.)

Biological Studies

An earlier study of the barramundi in T.P.N.G. gave a considerable amount of general information. It was found that—

- (i) in the Territory, the species is restricted to rivers discharging into the southern coastal plains of Papua. The Fly River and its tributaries carry the largest stocks;
- (ii) Barramundi live in the rivers and freshwater lagoons and swamps for most of the year, and make their way to the sea, presumably to spawn, in the wet season, October to March. Other small runs occur at other seasons, possibly related to rain in the catchment areas, and possibly also to migrations of prawns; and
- (iii) the fish which can be caught in the upper reaches of the rivers in the dry season are not of the same high eating quality as the sea run fish. Freshwater barramundi contain a large amount of fat

and the flesh has a distinct muddy or earthy flavour. The fatty tissue disappears when the fish migrate towards the sea.

Detailed information on the breeding biology will be collected during the present



Plate II.—Young barramundi with tag attached (Photo: D.I.E.S.)

programme. The reproductive organs of fish will be examined throughout the year, to determine the breeding season. It may be possible to correlate breeding season with environmental factors, particularly rainfall and river heights. The reproductive organs from fish of different sizes are being examined to determine at what length the barramundi is sexually mature, and also what length classes actually spawn. Fecundity of different length classes will be estimated. Some estimate of the number of times an individual fish breeds during its lifetime is also required. Breeding behaviour will be studied both in the field and in laboratory tests.

Pond Culture and Introductions

Because of its good eating quality and fast growth rate, the barramundi might be a good species for pond culture in the Territory. A thriving barramundi pond-culture industry is already in existence in Thailand. The main experimental work of the laboratory will involve keeping and rearing barramundi. Biologists will try to breed barramundi in experimental tanks. The possibility of large-scale pond culturing of barramundi in the Territory will be investigated.

River systems which do not support a barramundi population at present, particularly the Sepik and Ramu, will be studied to determine whether barramundi could be successfully introduced.

Not Enough Sun

INSUFFICIENT sunshine may be the reason that coconuts do not do well in south-west Bougainville. This is reported by Mr J. H. Sumbak, Agronomist at the Lowlands Agricultural Experiment Station, Keravat, in the December issue of the *Papua and New Guinea Agricultural Journal*. The coconut palms in this area show a very slow development, tardiness in bearing and very poor nut production. The palms look poor—they are characterized by upright fronds, few spathes and even fewer nuts.

Mr Sumbak investigated the nutritional status of the palms, and concluded that the cause of poor growth was not a nutrient problem. Other trees with a lower requirement

for sunshine, such as cacao and *Leucaena*, grow well, suggesting that there is little wrong with the nutrient supply in the soil.

In this area, particularly away from the coast, there is a heavy and continuous cloud cover most of the day. The amount of bright sunshine is often less than two hours a day. Sunshine recordings from Buin were very much lower than for other areas, such as Keravat, Aropa and Tigak, where palms do well. Although other factors such as poor planting material, pests and diseases could contribute to poor growth, it seems probable that the area is unsuitable for coconut and oil palm production because there is not enough sunshine for these crops.