

In 1985/86, the average cost of materials used in constructing a spat collector line 50m long in Takapoto, French Polynesia, was estimated at 90,000 CFP (Hauti et al, 1987).

Cost per 50m of spat line in each of the three sample locations was therefore as follows:

Rarotonga, Cook Islands	NZ\$	218
Christmas Island, Kiribati	A\$	190
Takapoto, French Polynesia	CFP	90,000

The use of galvanised wire mesh bags to cover the collector has been abandoned in French Polynesia. Originally intended to protect juvenile pearl oysters from predation, it was found that they prevented settlement of pearl oyster larvae by becoming clogged with other growth.

According to the French Polynesian experience, pearl oyster larvae seem to prefer the folded configuration of the "flower" collector shape (see figure 1 above). Some collectors of this type in Manihi had settlement of over 1,000 larvae each. As the larvae grow into juveniles, they must be harvested and transferred to

proper grow-out conditions, preferably by the time they are 30mm in diameter. If this is not done, crowding will cause the number of spat will diminish, either by dispersal (small pearl oysters are capable of movement) or mortality due to competition. The number of spat on one collector in Manihi was observed to fall from over 1,000 to 30 as the juveniles grew (Hauti et al, 1987).

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US dollar exchange rates for the currencies quoted in these articles were as follows in February 1990:

US\$ 1.00 = CFP 111 = A\$ 1.26 = NZ\$ 1.58.

Exchange rates have varied widely over the period covered by these articles. Costings should therefore be taken as indicative only, and confirmed independently if necessary.

## Christmas Island (Kiribati) Survey

A survey of pearl oyster stocks was recently undertaken in Christmas Island, Kiribati, by Being Yeeting (Research Unit, Fisheries Division, Ministry of Natural Resource Development, Kiribati), Garry Preston (Inshore Fisheries Research Project, South Pacific Commission), Ron Alfred (Marine Resources Authority, Ministry of Resources and Development, Marshall Islands), and Neil Sims (Zoology Department, University of New South Wales, Australia). Funding for the work was provided by the SPC Inshore Fisheries Research Project, UNDP, and the Kiribati Government.

Commercial quantities of shell had been taken from Christmas lagoon in the last century. Earlier this year, some trial purchases of shell had been made by the Marine Exports Division. The Fisheries Division needed to know if a commercial shell fishery was sustainable, and what management was appropriate.

Pearl oysters were concentrated in the deeper areas of the lagoon, close to the open passages in the west. The survey involved use of belt-transects, with stations selectively sited to obtain a broad picture of the pattern of distribution of pearl oysters. Unbiased estimates of maximum densities were obtained by randomly sited stations in the areas of greatest abundance. Spat-collector trials were initiated, with five lines each of 50 collector bags set through the lagoon. Unfortunately, insufficient younger pearl oysters were

found to permit any meaningful growth trials being established.

A total of only 34 pearl oysters were found during the survey, in densities that did not exceed 1 animal/100m<sup>2</sup> and averaged only 0.54/100m<sup>2</sup> in areas where pearl oysters were present. Extrapolation of average densities to the estimated 11 km<sup>2</sup> of suitable pearl oyster habitat in the lagoon gives a projected standing stock of about 60,000 shells – 23,000 (95% confidence limits). The population is therefore depauperate: this is probably attributable to the heavy harvests of the last century, and the more recent harvesting at lower levels, which, combined with heavy predation and poor conditions for juvenile settlement, has prevented population re-establishment. There is little or no potential for commercial exploitation of the wild stock in its present condition, and the survey team recommended a moratorium on further harvesting.

The potential for establishment of pearl farming activities was also assessed. Provided that steps are taken to re-establish the wild stock – deployment of spat collectors, juvenile on-growing, and perhaps broodstock aggregation – there is probably potential for farming activities, although not for several years. Nevertheless, conditions are not ideal in Christmas Island lagoon: large passes to the west and hypersaline conditions to the east and south mean that larval loss will probably be high, while the shallow, exposed

lagoon means that sturdy platforms will have to be used for shell growing, rather than the cheaper and easier to construct long-lines.

hauling. This will hopefully provide enough pearl oysters for initiation of grow-out trials.

Being is currently acclimatising to the weather at Bangor, on the north coast of Wales, where he is to undertake a Masters degree. On his return next year, the spat-collectors in Christmas should be ready for

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## Pearl Oyster culture in three French Polynesian atolls, 1986-1987

### Introduction

This information is extracted from two 1987 publications by A. Hauti et al (see reference listing this issue) of the French Polynesian Service de la Mer et de l'Aquaculture (SMA). All information relate to the black-lipped pearl oyster, *Pinctada margaritifera*. We hope to update and expand the information in the next issue of the bulletin.

Table 1 below gives details of the number of licenses issued by the French Polynesian government for activities related to pearl culture. Field studies by the SMA have helped to verify the true extent of culture activities (for a variety of reasons, some licensed operators do not always carry out culture activities, while others exceed their license entitlements).

**Table 1: Pearl culture licenses in FP in 1987 (and since 1977)**

Number of licenses								
Island group	Collecting		Ongrowing		Pearl farms		Total	
Society	0	(2)	0	(2)	0	(0)	0	(4)
North Tuamotu	340	(488)	174	(279)	53	(97)	567	(864)
South Tuamotu	53	(99)	23	(45)	10	(15)	86	(159)
Gambier	10	(23)	8	(21)	2	(14)	20	(58)
<b>Total</b>	<b>403</b>	<b>(612)</b>	<b>205</b>	<b>(347)</b>	<b>65</b>	<b>(126)</b>	<b>673</b>	<b>(1085)</b>

The three atolls described in the two reports are Takapoto, Ahe and Manihi, all in the Tuamotu islands. Pearl culture operations fall into three categories - spat collection, juvenile ongrowing (for sale to other farmers) and pearl culture. A brief description of the situation at each atoll is given below.

### Takapoto

The first spat collectors were deployed in Takapoto in September 1976. Because of the good results obtained, spat collection and ongrowing activities became extensive and the island became the principal supplier of seed oysters to pearl farmers in other islands of the Tuamotu group, notably Manihi, Arutua, Ahe and Aratika. The business of producing juveniles was lucrative, and local pearl farmers would import their preferred spat collector material, branches of a bush called 'mikimiki', from Tahiti.

Following the cyclones of 1983, which destroyed most coconut trees in the Tuamotu Islands, many small farmers turned to pearl oyster culture. Additionally, some Takapoto residents living in Tahiti

have been encouraged to return home after seeing the success of pearl culture operations there. Since the establishment of the industry 10 years ago, the population has nearly doubled. Most pearl oyster culture activity continued to be in ongrowing juveniles for sale to pearl farmers elsewhere. The price paid locally for live pearl oysters varied from 120 CFP for a 50mm individual, to 350 CFP for a 110mm shell.

In June 1985, massive mortalities occurred because of an unidentified disease. Signs of the disease were still evident in 1986, in both cultured and wild shell, and it seemed to be associated with increased production of faeces or pseudo-faeces by the oysters. Another recent development at the time was a noticeable increase in fouling of the shells by other marine organisms. In particular, growth of a particular kind of colonial tunicate was very heavy: this sometimes extended inside the edges of the shell valves, preventing their closure.

To prevent the spread of the disease, the government banned export of live pearl oysters out of Takapoto in 1986. As a result, some of the farmers principally