

tal seedings of aquacultured trochus in Palau and Vanuatu have been carried out in environments where trochus is already endemic).

Unfortunately, the survey did not find any *T. niloticus* on the island and, although it is too early to say that the seeding has not been successful (the

original seedstock would have to grow to sexual maturity before they could start proliferating, and would thus lag 2–3 years behind the seedings of adult shells that have taken place elsewhere), the experiment at this stage does not lend support to the concept of aquaculture as a management tool for natural trochus stocks.

Trochus production notes

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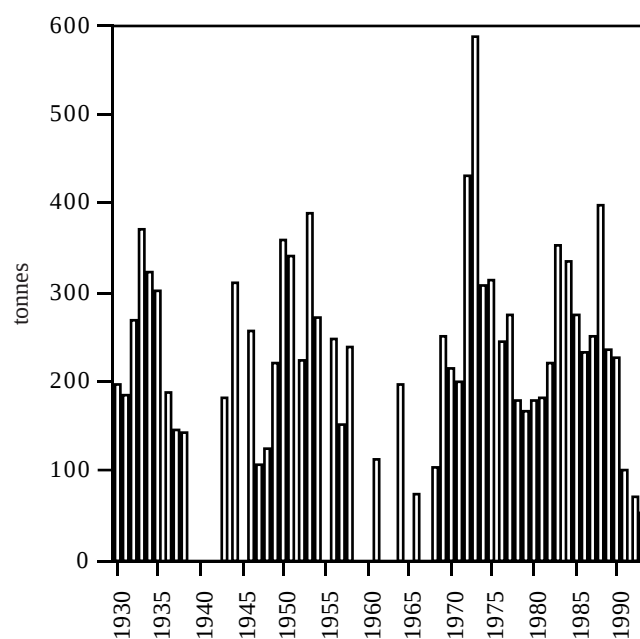
Little information is available at present (and we would be very grateful on updates from Trochus Special Interest Group participants), but few Pacific Islands appear to have exported trochus shell in 1993.

We hear that the 1993 export from *Palau* was only 7t or so, and this is apparently because the local price offered by private-sector buyers was the same as the 1992 price (Asap Bukurrou, pers. comm.). The fishing community had been expecting a substantial increase in the buying price for 1993 and Palauans were reportedly so disappointed with the US\$1.50 per lb on offer that very few people actually went out harvesting in 1993. Palau supplied over 200t of trochus shell to Japan in 1992.

In *Fiji*, legal restrictions on the export of trochus shell have now been gazetted as part of a package of measures to try and protect local investment in button factories. Exports of raw trochus shell from

Fiji dropped off again in 1993 (see histogram below), down to 52t from 71t in 1992 (Parmanand Singh, pers. comm.), and can now be expected to dry up altogether. The Customs-declared FOB export price per kilogram of trochus shell from Fiji in 1993 was F\$11.84 (around US\$8.30 per kg), up from F\$9.94 (US\$6.95) in 1992. The *Fiji Times* reports that the current local buying price for trochus shell at the factory gate is as high as F\$13 per kg.

In the *Federated States of Micronesia*, there has been no trochus harvest in Yap State for the past three years (1991–93); the last harvest, in 1990, exported 40t. FSM State Marine Resources Divisions normally perform trochus stock assessments yearly and decide on a harvest season and quota on the basis of these surveys. Trochus is not native to the other states, but has been introduced at various locations over the years. Pohnpei has had the highest average yearly production (71t) of the states since the 1970s.



Trochus Exports from Fiji (raw trochus shell)

Solomon Islands has traditionally been one of the major trochus exporters of the Pacific, averaging 387 t yearly in the period 1962–1991. In 1986, over 600 t were exported, but in 1991 this had dropped to 87.5 t (although 98 t or more was purchased by local button factories). The latest 'marine shells' export figures we have from Solomon Islands are for the period January–September 1992, by which time 79 t had been exported. In 1991, trochus formed 47 per cent of the exports of 'marine shells'. If the percentage is similar in 1992, and scaling the estimate to allow for the missing final quarter of 1992, we estimate that the export of trochus shell from Solomon Islands in 1992 was approximately 49.5 t. Customs export figures have not yet been compiled for 1993 (Willington Piduru, pers. comm.).

New Caledonia is another traditionally major producer, averaging 347 t per year of exports in the period 1962–1991, although there was an enormous peak of nearly 2,000 t in 1978. In 1992, 185.5 t of trochus shell were exported from New Caledonia at a local buying price of 250 FCFP per kg (around US\$2.50 per kg). In 1993, exports were 222.5 t, and the average 'farm-gate' buying price in the Northern Province was 238 FCFP per kg (US\$2.35) (Régis Etaix-Bonnin, pers. comm.).

Trochus shell exports from *Vanuatu* have averaged 76 t per year over the past 20 years, with a peak of 220 t in 1976. Vanuatu had five domestic button factories in 1993, each of which had a quota of 75 t of raw shell per year. It is probable that most of the shell fished in Vanuatu is now locally processed, and thus it has become impossible to estimate production from the export figures for raw shell. Unfortunately, the Vanuatu Customs figures do not clearly categorise the export of raw shell, buttons or blanks, and scrap, so it is not possible to estimate production indirectly from the button export figures.

The other major producer in the Pacific Islands region is *Papua New Guinea*, which averaged 380 t per year in the decade 1980–1990 (and exported over 1,000 t in 1951). Unfortunately we have no recent figures on trochus exports from PNG.



Trochus reseeded experiments in Australia and Vanuatu

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A collaborative project between Vanuatu Fisheries Department and James Cook University (Australia) is looking into the ecology of cultured juveniles *Trochus niloticus* shortly after released onto coral reefs, in particular the effects of seeding density, juvenile size and habitat on juvenile survival.

The project is funded by the Australian Center for International Agricultural Research (ACIAR). Field work has been done at Moso Island (Vanuatu) and Orpheus Island (Australia), following similar methods to allow comparison of results at a geographical scale and to determine how general are the processes occurring to juveniles on reefs.

Results of various experiments indicate that, after 3 days, 20–40% of the juveniles released are missing and predation is likely to be most important cause of mortality. We used seeding densities between 5–30 juveniles / m² and found no significant effect of the initial density on survival.

However, based on natural densities of wild juveniles on the reef, seeding densities no greater than 10 juveniles / m² are advisable. The tidal height at

which the juveniles were released did not have a significant effect on survival. The intertidal zones at both Orpheus and Moso Islands average more than 200 m wide and more than 1 kilometre in length.

We released juveniles at various tidal heights and found that juvenile survival varies highly both within one tidal height and among the various tidal heights. Although homogeneous over a broad scale the intertidal habitat where *trochus* juveniles live is highly heterogeneous on a small scale, i.e. in distri-

