

longed not to the Australian Government, but to all people. Pressed a little further, they expressed an interest in a cooperative venture of some kind between themselves and the Aboriginal people at One Arm Point. Many had heard of proposals for Australia to assist with setting up a hatchery project in Indonesia to restock the reefs closer to home. Whether this idea, which was to be set up through the Department of Foreign Affairs, is going ahead appears uncertain at the moment.

However a long-talked-about hatchery project for

The August 1992 transplantation of trochus to Tonga and Niue

by Bob Gillett

This work was completed by Bob Gillett as part of the FAO/UNDP Regional Fishery Support Project which closed its doors at the end of 1992.

Trochus niloticus is commercially the most important gastropod in the Pacific Islands. It occurs naturally from islands in the Indian Ocean east to Wallis and the Lau Group of Fiji. Starting in the 1920s, trochus has been transplanted outside its natural range to almost every island group and has resulted in the establishment of substantial fisheries in many locations. Since 1986 the FAO/UNDP Regional Fishery Support Programme (RFSP) has transplanted trochus in six operations to nine islands in Tokelau, Tuvalu and Western Samoa.

Niue and Tonga have been interested in obtaining trochus for several years but transportation has been a problem. In July 1992 the Defense Attaché at the U.S. Embassy in Suva, Major Timothy Christenson, informed RFSP of the possibility of using U.S. military aircraft to transport trochus to Niue and Tonga from Fiji.

On 21 July he confirmed that a flight would be possible on Saturday 8 August. Still on 21 July, I departed Suva for Lakeba Island for three days to make preliminary arrangements for the collection of trochus.

The world market price of trochus has increased significantly in recent years. This has caused trochus to be relatively scarce near populated areas. The island of Lakeba was chosen as a source for the transplant because its isolation results in reduced fishing pressure on trochus, yet it has an airstrip. Lakeba is a fairly round island with eight villages on the perimeter.

In consultation with Fisheries Division officials in Lakeba, it was decided that it would be best to meet with divers at each of the villages. Accordingly, a

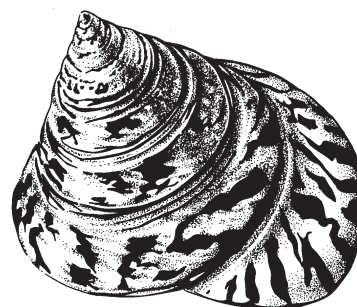
One Arm Point is being set up through the Maritime Studies section of Technical and Further Education (WA) and the Aboriginal involvement in business enterprises. An important spin-off of this work is that finally some assessment of the trochus stocks and population dynamics in the King Sound area will be carried out, something long overdue.

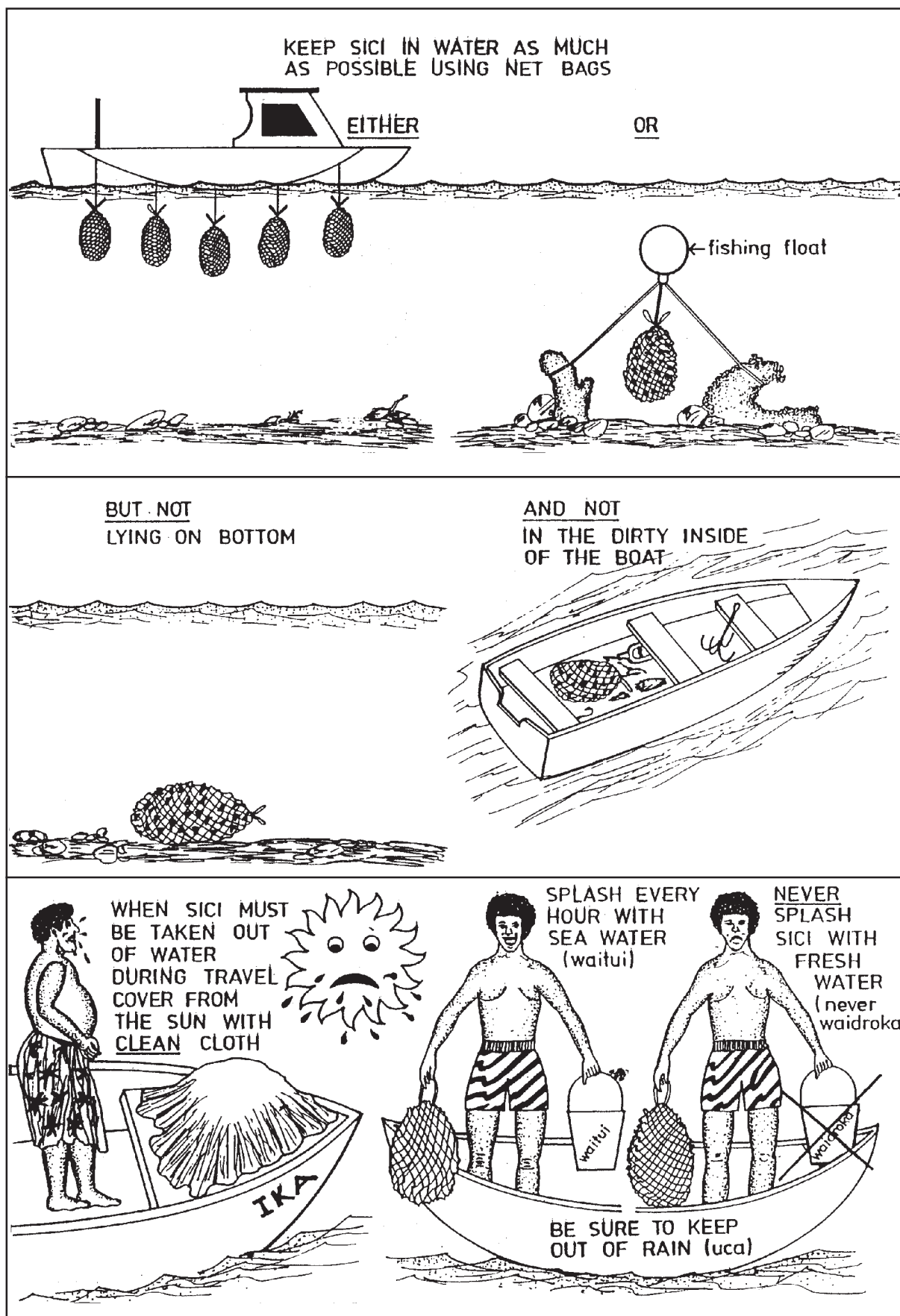
trip was made around Lakeba, stopping at each village. Because most of the divers in Lau are harvesting beche-de-mer at present, little trochus is taken in Lakeba. The price ranges between F\$3 and F\$6 per kilo or about F\$.60 to F\$1.20 per empty shell.

I therefore proposed to pay F\$3 per live trochus, which appeared to offer adequate incentive to the divers to temporarily stop beche-de-mer activities. The need for having live trochus was explained and a pictorial explanation was circulated.

On 31 July I rang the U.S. Marine Corps Operations Center at El Toro, California and spoke to Major Wormeester. He said that 'barring an act of God, the C-130 will be able to land at Lakeba and Vava'u'.

We returned to Lakeba later the same day in preparation for the actual transfer operation. It was decided to commence diving on Wednesday 5 August. A telephone call on 3 August to T. Christenson at the U.S. Embassy revealed that, because of the length of the Lakeba landing strip, it would probably not be possible to land the C-130 Hercules.





Poster explaining how to keep trochus alive

We then switched to the backup plan and reserved 300 kg of cargo (at F\$ 1 per kg) on the 7 August Fiji Air flight to Suva where the C-130 would pick up the trochus. That would allow, however, only two days of diving. At that point there was concern about receiving more trochus than we could pay for or transport. On 5 August we learned of another complication. Because of construction activities at the Vava'u airstrip, only small planes were able to land. This resulted in a plan to land in Tongatapu and use the local Twin Otter aircraft to fly to Vava'u.

5 August was a fairly calm day and a total of 295 trochus was collected from the villages; 185 came from Nasagalau Village. It was windy, rainy and cold on 6 August and fewer trochus were obtained. The overall total was 555 shells.

On 7 August I received a call from our office indicating that the Hercules had broken down in Hawaii and the operation had been cancelled. At that point I booked 150 kg of excess baggage (at F\$ 4.20 per kg) on the flight from Suva to Tongatapu. At mid-morning the trochus were re-bagged. The total number was at that point 545; some small ones apparently fell out and I kept an unusually large 16.5cm specimen. The total weight was 174 kg or about 3 trochus per kg. Although there was some thought that the Fiji Air flight from Lakeba to Suva would be cancelled due to horrible weather, we arrived in Suva at 1500 hrs.

Because of some misunderstanding, my booking for 150 kg of excess baggage on the flight to Tonga the next day had disappeared. A quick check of the airline schedule showed that another flight would depart shortly, excess baggage was booked, a panic dash was made to the airport. On arrival in Tongatapu at midnight all trochus were taken to the Fisheries Division where they were placed in two newly constructed aquaculture tanks. I then learned that, because several flights that day from Tongatapu to Vava'u had been cancelled, the airline would not carry any excess baggage. At 11h00 the next day I took 30 kg of trochus (approximately 100 shells) on the flight to Vava'u and left my suitcase behind.

The shells were placed about one mile east of Tapania Island, a reef half a mile east of Fenua Tapa. The bottom was flat rock strewn with coral boulders. About 20 trochus were placed on each of five of these rocks.

Soon after placing the trochus I contacted personnel of the New Zealand Navy aboard the ship *Canterbury* then visiting Vava'u. They had received official notification from New Zealand authorities

that they would be carrying trochus to Niue. I arranged a meeting for the following day to demonstrate to the ship's officers how best to transport the shells. The meeting did not take place: a diving accident occurred during the night and the ship left at midnight to take a patient to a recompression chamber in Tongatapu.

9 August was a Sunday and it was impossible to travel or make any travel arrangements. On 10 August I learned that it would not be possible to travel to Tongatapu for at least three days to pick up the remaining shells or visit the *Canterbury* (now in Tongatapu) to arrange for transporting shells to Niue.

I spent the next few hours on the phone trying to bargain the remaining trochus onto the flight. In summary 150 trochus arrived at 15h30 and were taken to a location half a mile north of the earlier implant site, probably an extension of the same reef. Although there was less wind, there was more wave activity, suggesting the area was more exposed to the open sea. There were also somewhat more holes, pockets and ridges in this reef: an apparently ideal trochus habitat. Twenty-five trochus were placed in one spot, 50 about 200 metres north, and finally the remaining 75 about 500 metres further north.

On my return to Tongatapu, I was told by Tonga Fisheries Department workers that approximately 260 trochus had been transferred to the *Canterbury* by the Fisheries Department. They were placed in two plastic containers and were constantly flooded with a deck hose. An additional 35 trochus were kept by the Tonga Fisheries Department for spawning, experiments, and algae control in the tridacna tanks.

Communication with the fisheries workers in Niue indicated that the *Canterbury* arrived early on 12 August (Niue date) with 213 trochus in four net bags. All the trochus were alive, however the total number to arrive was approximately 46 trochus less than that reported to have been placed on the vessel in Tonga. This apparently corresponds to one net bag full.

Ninety-nine trochus were placed on the reef at Uani near Hakupu Village, 77 at Matalave and Makatutaha near Namukulu Village, and 47 at Patuoto near Tamakautoga Village. The placement was complete by 1000 hrs on August 12.

In summary, 250 trochus were transplanted to Vava'u, 213 were transplanted to Niue, and 35 retained in Tongatapu.