

condition, this year's production should contribute a good stock for future releases.

### Other activities

Some public awareness campaigns on trochus and green snail transplantation were aired from Radio Tonga from December 1999 to July 2000. The public was urged to protect these important resources until they reached harvestable size. The program released information on their new recruitment and SMC activities.

### Future direction

Future direction for both species, as recommended by Nuimeitolu et al. (1999), was proposed for implementation by the MOF. However, for the time being MOF should concentrate on seed pro-

duction of the green snail, seed release for establishment of spawners' groups, and recruitment surveys. Also the MOF should impose a continuous ban on the harvest of green snails and trochus until their populations are sufficient to support a sustainable commercial fishery.

### References

- Japan International Cooperation Agency. 1999. Basic design study report on the project for renovation of seawater supply system in the Kingdom of Tonga. GRT CR (2) 99-046:86 p.
- Nuimeitolu S., M. Mateaki and K. Kikutani. 1999. Report on the seed releasing and restocking survey of trochus and green snail. In: Technical report of the JICA short term expert: 11 p.



## Protecting the trochus bounty

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The coral reef flats of the inner islands of King Sound number in the hundreds. These environments present almost idyllic conditions for a much-underestimated species of mollusc commonly known as the trochus or topshell. The trochus (*Trochus niloticus*) once existed in these tidal zones in huge numbers. These zones are in pristine condition with no negative impacts from run-off from settled or industrial areas. However, a combination of overharvesting over the last 20 years and, to a lesser extent, poaching by illegal foreign fishers, has seen trochus populations plummet. From a maximum recorded harvest in the 1980s of 135 tonnes, the current level of harvest is less than 15 tonnes.

Modern fisheries management ensures that sustainable harvesting practices are applied through innovative aquaculture programs and education of local fishers. The impact of illegal foreign fishers collecting the shell is addressed in a more proactive, hands-on approach.

The International Operations Section (IOS) of Fisheries Western Australia is a dedicated and expe-

rienced team of professional compliance officers who undertake a wide variety of demanding tasks on behalf of the Australian Fisheries Management Authority (AFMA), Australia's federal fisheries management agency. They operate in all environments and extremes: from the tropical areas of Cocos and Christmas Islands in the Indian Ocean, to the Antarctic waters of Heard Island in the Southern Ocean, their role in providing monitoring, control and surveillance services is state of the art. For IOS officers based in Broome, Western Australia, keeping an eye on the trochus stocks of King Sound is just one of their various fisheries compliance tasks.

The trochus of King Sound are sought after by Indonesian fishers, who have a small window of opportunity to seek their bounty. The usual practice is to make their way from Indonesia to the north and to enter King Sound under the cover of darkness. The maze of mangroves and tidal ranges of 10 metres allow them to conceal their vessels during the day.

Typically, the vessels used are around 10 to 15 metres with a crew of anywhere from 12 to 30. A

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large crew ensure a brief period of exposure when collecting the shell. Low tide exposes the trochus for a speedy harvest, sometimes in broad daylight. A moving frontal line of poachers edges across the reef zone, ensuring no shell of any size escapes capture.

Once the fishing vessel is full to capacity or time and tide dash their efforts, the poachers make their escape. In order to go undetected, the fishers may again hide their vessel among the thick mangroves fringing any one of the myriad of islands in the Sound. When darkness approaches, the poachers motor out of the Sound to open water and run for home. The closest island in Indonesia is only 360 nautical miles to the north of King Sound.

Although the majority of Indonesian vessels used are motor powered, occasionally traditional sailing vessels are used.

A Memorandum of Understanding (MOU) was developed in 1974 between Australia and Indonesia. Australia agreed to permit Indonesian traditional fishers to exploit an area of more than 1500 square nautical miles inside the Australian Fishing Zone (AFZ). The MOU area is Australia's gesture to Indonesia to support limited efforts of traditional fishing practices. The view being that Indonesians may have used the region historically and since no Australian effort of significance was applied to the area, there was room for Indonesian fishers.

Under normal circumstances Indonesian fishers are allowed to operate in the MOU area using only traditional means. The definition of traditional is quite specific – a traditional vessel is made of wood, is sail-powered, and does not have an engine. Any fishing methods used must also be traditional. Such a traditional sailing vessel observed in the MOU area would not cause concern if sighted by surveillance aircraft.

A sailing vessel intending to take trochus from King Sound can travel from Indonesia through the MOU area to its most southerly border. From this border to the entrance to King Sound is only 120 nautical miles. Thus, the poachers' exposure to detection is reduced to 20 hours instead of 60 by transiting the MOU area and by appearing from the air, to be a traditional sailing vessel. The run home is equally assisted by the area's safe waters.

Motor vessels are not permitted in the MOU area. Their voyage from Indonesian waters (at the outer edge of the Australian Fishing Zone) to King Sound is approximately 250 nautical miles. At an average speed of 6 to 12 knots they are exposed to

detection for around 30 to 40 hours. The return voyage to the safety of Indonesian waters may be considerably slower, a moderate-sized trochus boat can carry 1 to 2 tonnes of trochus.

To combat these poachers and to ensure that *T. niloticus* has a chance for survival, Australian Fisheries Officers call upon the resources of the Royal Australian Navy and the aircraft of the Australian Customs Coastwatch surveillance service. Coastwatch carries out almost daily aerial patrols of the King Sound area, which assists in the detection of poachers. The fishers, however, are well versed in the best ways to avoid such detection. International Operations Section Fisheries Officers patrol the waters of the Sound aboard Royal Australian Naval Patrol Boats. This enables them to actually investigate the shores and beaches of the islands. These experienced officers are extremely familiar with the poachers' activities and can easily identify if poachers have been in the area.

Apprehension of trochus poachers by Fisheries Officers is usually generated by either a sighting by surveillance aircraft, or as a result of a report from local fishers of an unusual noise or vessel on the horizon. On the still and magical Kimberley nights, the putt-putt noise of an Indonesian single-cylinder diesel motor is extremely distinct and carries for miles and miles. There is usually no mistaking the sound as most local fishing vessels use high speed modern marine diesels.

Once apprehended, sail or motor vessels are towed or escorted to the WA town of Broome. Situated some 150 nautical miles south of the entrance to King Sound, Broome is the base for one of the world's richest pearl operations. Poachers are held at a site 10 miles north of the Broome townsite, in a creek that serves as an immigration and fisheries detention centre. There, the poachers are monitored until their case comes to court. Typically, they may wait a week or so, and a guilty verdict means one of two options. First offenders are usually served a Good Behaviour Bond and previous offenders are guaranteed a gaol sentence.

Over the past few years the number of poachers to King Sound has dropped slightly. One can hope this is due to the presence of Australian authorities and not as a result of low stocks of trochus.

