HAWAIIAN-STYLE DECAPTERUS FISHING TRIALS IN TONGA

by

Robert Gillett
FAO/UNDP Regional Fisheries Support Programme
Suva, Fiji

Introduction

In March 1987, Hawaiian-style decapterus fishing trials were carried out in Niue. The results of this work were presented at the SPC Regional Technical Meeting on Fisheries in 1987. At the meeting, representatives from several South Pacific countries expressed interest in conducting similar trials and it was subsequently decided that Vava'u, Tonga would be the most appropriate location for the fishing. This decision was based on support by the Tonga Fisheries Division, previous ease of carrying out experimental fishing work in Tonga, and the fact that Paul Mead, an SPC Masterfisherman involved in gear development, was based in Vava'u. The month of February was chosen to do the trials, on the basis of reports of an abundance of decapterus on the local fish aggregating devices (FADs) and in nearshore pelagic areas during the previous February. In addition, decapterus is characteristically plentiful in February around Niue Island, which is relatively near Vava'u and at a similar latitude.

Decapterus

Fish of the genus *Decapterus* are called 'atule kau' in Tongan and scads, round scads, and mackerel scads in English. As in other members of the family Carangidae, scutes are present on the posterior lateral surface of the fish body. The feature that distinguishes these fishes from other carangids is the finlet behind the dorsal and anal fins. Personal correspondence and a review of the recent literature indicate that four species of decapterus are common in the Islands of the South Pacific: *Decapterus macarellus* (Figure 1), *D. macrosoma*, *D. kurroides* and *D. russelli*.

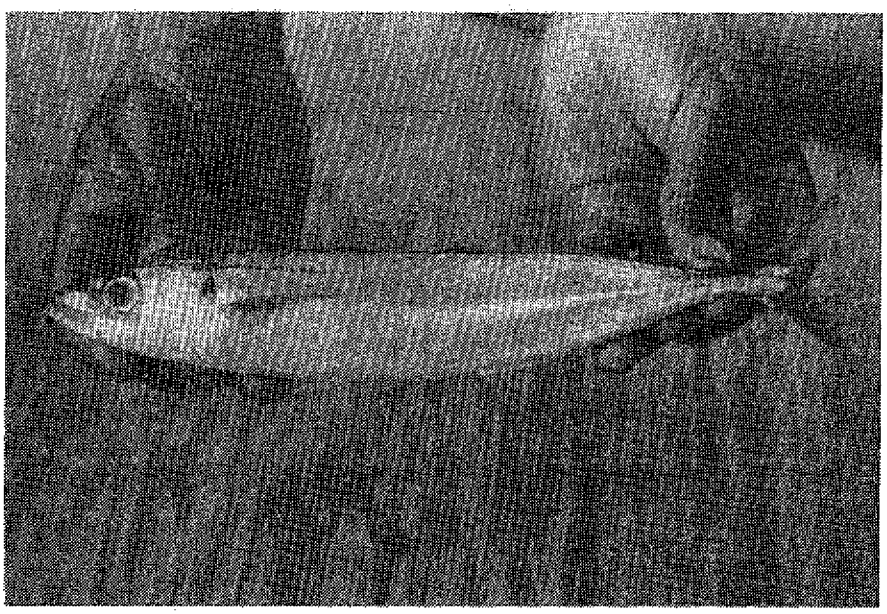

Figure 1. Decapterus macarellus

The most significant fishery for decapterus in the Pacific Islands is in Hawaii, where an average of about 122 tonnes of *D. macarellus* are captured per year. The majority of this catch is taken by hand lines and hoop nets. A diagram of Hawaiian hoop gear is given in Figure 2.

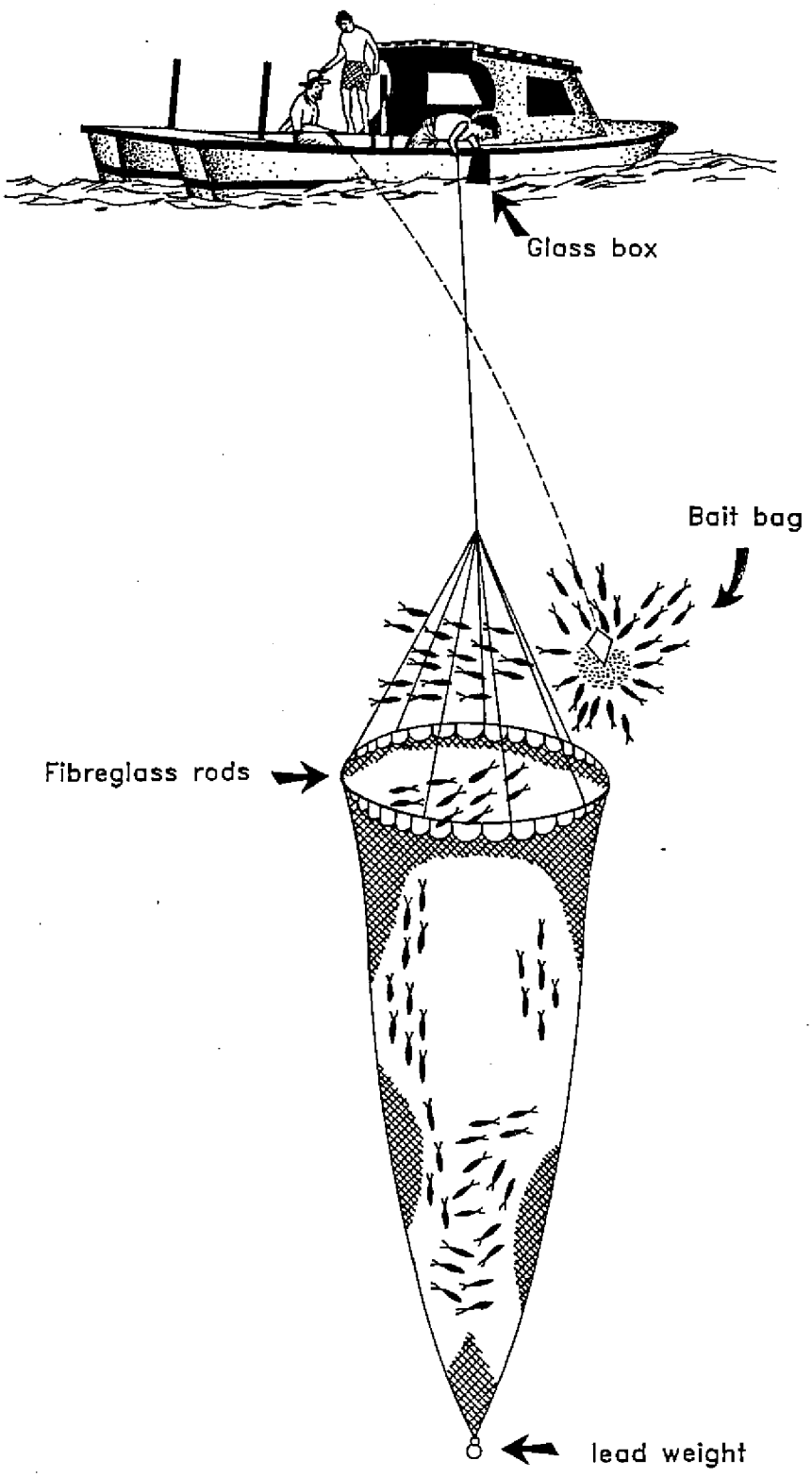

Figure 2. Hawaiian techniques for capturing Decapterus.

Tsubaki and Kawasaki (undated) give details on the catches made by a small purse seine vessel in Tonga. They report that *D. russelli* and *D. macrosoma*, along with two other carangids, comprised 38 per cent of the catch of the seiner in Vava'u.

The Tonga survey

The survey was carried out from 9 February to 1 March 1988. Personnel consisted of Paul Mead (SPC Masterfisherman), Robert Gillett (FAO/UNDP Fisheries Development Adviser), Mark Bondurant (U.S. Peace Corps Volunteer), Peni Lolohea (Tonga Fisheries Division) and Ekani Lisiate (Assistant to the Masterfisherman). A 10 metre open fibreglass skiff powered by a 55 hp outboard engine was used on all fishing expeditions. On one occasion an 8 metre diesel launch equipped with a Koden colour depth sounder accompanied the skiff.

The fishing gear consisted of the net, weights, fibreglass rods, chum bag, and sight box. Details of the equipment are given in Gillett (1987). Much of the work in the Tonga survey consisted of casting the chum bag to a desired depth, releasing the bait, and observing through the sight box any fish which might be attracted to the area. Bread, cabin biscuit, canned mackerel and pumpkin were used as chum.

Thirteen fishing expeditions were carried out during the survey period. The purpose of two trips was to familiarise the crew with setting the net and to practise manoeuvring fish with chum. Eleven of the expeditions were made specifically to locate areas in which decapterus were present. Most of the searching effort was directed towards areas in which decapterus would be vulnerable to hoop net gear, that is, nearshore pelagic areas in water 25 to 60 metres deep on the lee sides of islands and around four FADs. The locations surveyed are shown in Figure 3. Most of the decapterus prospection was done in the period shortly after dawn to mid-morning.

A Hawaiian fisherman with a long involvement with the decapterus fishery, Walter Paulo, was consulted twice by telephone.

Results and discussion

During the survey period, decapterus were not observed in areas where they would be vulnerable to the hoop net. After failing to detect these fish in these sites, the team searched other locations such as entrances to channels, shores of deep bays, windward sides of reefs, and isolated rock islands. This was similarly unsuccessful. Decapterus were observed on a few occasions at evening twilight in some of the calm bays, but poor water clarity and the fact the fish were not attracted by the bait eliminated the possibility of fishing in these areas.

The absence of decapterus in nearshore pelagic areas and around FADs was markedly different from that reported by the SPC Masterfisherman during the previous year. During February 1988 the weather was much warmer than usual, there was an uncharacteristic lack of wind, and the sea surface temperature was reported to be above normal. Perhaps these atypical environmental conditions may have affected the distribution of decapterus. It is interesting to note that during this period schools of skipjack tuna were rare in the area around Vava'u.

A small purse seine vessel, the *Albacore*, operated in Vava'u during the survey period. Seining was carried out in some of the larger bays at night by attracting schooling pelagics including decapterus by lights. The decapterus in the catch were tentatively identified by the staff of the survey as *D. macarellus* and *D. russelli**. During four nights of fishing an average of 116.5 kg

* Tsubaki and Kawasaki (undated) report, however, that *D.macrosoma* and *D.russelli* were present in the purse seine catch. During the present survey, specimens were forwarded to decapterus taxonomic authorities for verification.

of fish (57% selar and decapterus) were reported captured. In contrast, during February 1985 (the only other February for which catch data were available in Vava'u), the average catch per night was almost twice as large. This supports the contention of a reduced abundance of decapterus in February 1988.

It should be noted that decapterus attracted to lights at night are not vulnerable to hoop net fishing gear as they move too rapidly.

When casting the chum bag it was noted that a species of fusilier (*Caesio* sp.) was attracted and reacted similarly to decapterus. In the absence of decapterus, practice sets were made on the fusiliers to gain experience with the net and with enticing the fish into the area at the mouth of the hoop.

Future work

Because of the apparent absence of decapterus in areas where hoop net fishing gear can be used, it was not possible to evaluate the suitability of the technique for areas such as Vava'u. Assuming that the month was atypical with respect to decapterus abundance and distribution, there are several options for future hoop net trials. The SPC Masterfisherman and his assistant are well acquainted with the gear and the trial sets on fusiliers have allowed them to become familiar with the techniques for manoeuvring fish. All the fishing gear used in the survey was turned over to the Masterfisherman, along with sufficient funds for outboard engine petrol for seven fishing expeditions. If further assistance is required from FAO/UNDP staff, it may be possible to arrange this in conjunction with bibliographic work planned for Tonga in the near future. Alternatively, the services of a Hawaiian decapterus fisherman may be considered more appropriate.

Other matters of interest

In the course of searching for decapterus, several large coral heads were examined for the presence of cardinal fish. In the eastern lagoon, a coral head containing an estimated 100 kg of various species of cardinal fish was located. In Tuvalu, it has been shown (Gillett 1985) that these fish can be used as a supplement to night catches of baitfish for pole and line operations. In addition, their very low mortality in bait tanks allows them to be used on small, non-specialised fishing craft.

References

Gillett, R. (1985). *Tuvalu baitfish survey and development project*. Tuna and Billfish Assessment Programme Technical Report No. 14, South Pacific Commission, Noumea, New Caledonia.

Gillett, R. (1987). *Hawaiian-style decapterus fishing trials in Niue*. Document 87/4, FAO/UNDP Regional Fishery Support Programme, Suva.

Lewis, A., B. Smith, and C. Ellway (1983). A guide to the common tuna baitfishes of the South Pacific Commission area. Handbook No. 23, South Pacific Commission, Noumea.

Tsubaki, H. and H. Kawasaki (undated). *Small purse seine fishing in Tonga — report of 'Albacore'*. JOVC, Tonga Fisheries Division, Nuku'alofa.