

ORIGINAL : ENGLISH

SOUTH PACIFIC COMMISSION

EIGHTH REGIONAL TECHNICAL MEETING ON FISHERIES
(Noumea, New Caledonia, 20 - 24 October 1975)

SKIPJACK AROUND NEW ZEALAND

By

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SUMMARY

New Zealand skipjack belong to the eastern and central Pacific population. The main season is December-April around the northern North Island. Fish range from 35-75 cm with most between 45 and 60 cm. There is no evidence for skipjack spawning around New Zealand. Schooling patterns appear to change on an approximately monthly pattern from large areas of scattered fish to schools of 70-200 tonnes. Skipjack are caught by trolling, pole fishing (with live and dead bait), gill-netting, purse-seining and in box-nets. The further development of the present small-scale fishery is dependent on economic conditions: the resource could provide greater landings than at present.

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BIOLOGY

Population:

1. Fujino (1970) has shown that skipjack caught in the Bay of Plenty belong to the eastern and central Pacific population. The relationships of the skipjack on the west coast and in the Tasman Sea across to Tasmania and eastern Australia are not known.

Distribution:

2. Skipjack are most abundant around the north of the North Island, although they occur south to Cook Strait on the east and to about Jacksons Head on the west.

3. They are usually in clear blue water, although they occasionally occur in discoloured or green water and have even been taken in estuaries. If the blue water is very close inshore the skipjack will enter very shallow water. Most surface schools have been seen within 12 miles of the coast: the off-shore distribution and abundance of the species is unknown.

4. Skipjack are most usually taken in surface sea temperatures of 18-22°C (64-72°F).

Seasons:

5. Skipjack have been caught in all months of the year. The main season of abundance is from mid-December through April with peak sightings of surface schools in January to March. In the winter months small fish are occasionally taken around the north-east coast.

6. Skipjack arrive all along the northern half of the North Island on a broad front at about the same time. First sightings of schools have been at 12-20 miles off-shore, but soon after this schools appear inshore on both coasts of the northern North Island.

Migrations:

7. Nothing is known of the oceanic migration pathways of the skipjack which occur around New Zealand. About 150 were tagged in 1975, but so far none have been recaptured.

Size:

8. Fish range from about 35-75 cm in fork-length and 1.1-5.75 kg net weight. In 1975 in the Bay of Plenty fish caught inshore by trolling and gill-netting were larger than those taken off-shore by purse-seining. The modal lengths of fish taken off-shore in purse-seines show little progression (mode at 51-52 cm through the season), but the modal length of gill-netting and trolled catches increases by about 10 cm through the season. This reflects changes in either distribution or behaviour of fish close inshore.

Gonad state:

9. The great majority of fish show little or no indication of ripeness, although some fish have gonads in early states of ripening. There is no evidence of spawning in New Zealand waters.

Feeding:

10. Fish caught off-shore by purse-seining during 1974 and 1975 had either empty stomachs early in the season or, later in the season, were feeding on euphausiids. Fish caught inshore are usually feeding intensively on anchovy (Engraulis australis) or other fish such as pilchard (Sardinops neopilchardus), yellow-eyed mullet (Aldrichetta forsteri) or saury (Scomberesox saurus). Feeding activity is most intense from early morning to mid-day with further activity in the late afternoon.

Schooling:

11. There is some evidence in the 1974 and 1975 seasons for regular changes in school behaviour. Over a few days sightings changed from large schools of 70-150 tonnes (with exceptional schools of 200-600 tonnes) to small schools of 10-20 tonnes, and then to large areas of scattered jumping fish. This was followed by gradual reorganisation into large schools. The time scale of this behaviour appears to be about monthly: whether it is directly or indirectly (for example, through the behaviour of a food organism) related to moon phase has not been established. If such behaviour patterns usually occur they have obvious implications for fishing strategy.

FISHING

General:

12. The lack of a large local market has restrained fishery development, as has high freight costs to other markets. Most New Zealand tuna fishermen aim for the higher priced albacore, rather than skipjack. Skipjack fishing is only marginally profitable under present conditions unless catch rates are exceptionally high or the fisherman has a profitable local small-scale outlet, for example, as smoked skipjack.

Trolling:

13. Skipjack can be readily taken by trolling and a variety of lures are used. Small vessels tow 6-10 lines and out-riggers are usually used. Unless barbed trolling hooks are used many strikes are lost.

Gill-netting:

14. Monofilament 140 mm mesh (5 inch) gill nets 145 m (160 yards) long and 150 mesh deep have been used experimentally for skipjack. Experience has shown that the most effective method is to shoot a single net in a crescent ahead of a moving school. A gill net can be used from a small boat with a two or three-man crew, although hauling large catches is hard work! Shooting takes less than a minute, and if there is no catch, hauling and stowing takes only five minutes. Catches have been improved by chumming the net with anchovy during shooting.

15. Gill-netting is seen as an opportunist method for use when suitable schools are present. Setting a fleet of nets for a long period was not found to be a satisfactory method of fishing.

Pole fishing:

16. Small one or two-man boats have pole fished successfully in the Bay of Plenty. On these boats poling is used together with trolling and sometimes gill-netting. Anchovy, often dead, are used as bait fish, but other small fish are also used.

17. Larger vessels have pole fished, but primarily for albacore. Despite occasional high catching rates skipjack pole fishing from larger vessels has not been profitable because of the low market prices. Most vessels have operated singly and have had insufficient experience of both good bait fishing and skipjack fishing areas to cover servicing and crewing costs. A larger fleet with more experience would probably be more successful.

18. Small boats use ice to chill and store fish. Some of the larger boats use brine spray freezing.

Purse-seining:

19. Local purse-seiners have caught very little skipjack. This is thought to be due to both the size of the nets used and inexperience of the crews in tuna seining. The U.S. purse-seiner ("Paramount") participating in a survey of tuna resources around New Zealand by purse-seining found skipjack behaviour to be subtly different from the behaviour in the eastern Pacific, but nonetheless in the 1975 season caught 1000 tonnes in 35 days' fishing. Following Paramount's experience the two New Zealand purse-seiners have modified their nets and are hopeful of better skipjack catches in the future. Paramount's best fishing was in January to February and her best single haul 155 tonnes.

Box nets:

20. Skipjack are occasionally taken in the three large Japanese "Teiche" nets presently set around the north-eastern coast. These nets fish passively and catch schools migrating along the coast. Skipjack are only a small part of the catch and are not caught in quantity.

Future work and prospects:

21. A programme on the biology of skipjack around New Zealand has started recently with the appointment of a scientist to work on this topic in Fisheries Research Division. Aspects for study will be the general biology, distribution and migration patterns of skipjack. It is anticipated that tagging will be a major part of the project so as to obtain information on the relationships of New Zealand skipjack to those of other areas.

22. The development of a skipjack (or indeed any tuna) fishery in New Zealand is dependent wholly on economic conditions. The local market is small but the present stock appears large. Whether or not catches can be sufficient to justify the establishment of a local cannery for export marketing is yet to be established.

Reference:

FUJINO, K. 1970. Range of skipjack populations in the western Pacific Ocean in The Kuroshio II. Proc. 2nd Symp. Results of CSK.
