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(Noumea, New Caledonia, 4-8 August 1986)

COUNTRY STATEMENT - NEW ZEALAND

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Status of Tuna Resources and Tuna Research - 1986

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Summary

This paper summarises tuna catch and effort data collected in the New Zealand Exclusive Economic Zone for the 1985 calendar year and updates our reports to the sixteenth and seventeenth Regional Technical Meeting on Fisheries. Research on South Pacific albacore and results of recent trolling surveys are reviewed.

Recent trends in New Zealand Tuna Catches

Tuna landings and fishing effort for the domestic fisheries are shown in Tables 1 and 3. Skipjack landings continued the decline first evident in 1984. Reports by vessel captains suggest that the lower catch was due to the scarcity of suitable surface forage, chiefly the euphausiid Nyctiphanes, and the low number of schools which could effectively be purse-seined. Of the vessels landing skipjack (43 in 1985) only 4 were purse-seiners, the remaining 39 catching skipjack incidental to other methods. Albacore landings in 1985 were again high

with albacore caught as late as August by troll vessels fishing for southern bluefin. The catch consisted of larger fish than seen in 1984, with most albacore being 58-60 cm fork length. Catches of yellowfin remained small while those of southern bluefin continued to decline.

There are two foreign longline tuna fisheries operating in the New Zealand EEZ. The southern fishery consists of Japanese flag vessels while the northern fishery is composed of Korean and Japanese vessels. The southern fishery targets primarily for southern bluefin with some effort devoted to bigeye at the start and end of the season. The trends in this fishery have been towards reduced fishing effort and a decline in catches of all tuna species apart from southern bluefin. The northern fishery targets for albacore and in recent years has been increasing its effort in N.Z. waters. Catches of all tuna species in this fishery have increased and account for most of the 14% increase in tuna catch by foreign vessels in 1985. The catch and effort statistics for these fisheries are presented in Tables 1 and 2, and catch per unit effort data are presented in Table 4 for the period 1980 to 1985.

New Developments in New Zealand Tuna Fisheries

Early in 1986 the New Zealand Fishing Industry Board sponsored an experimental fishing operation targeting for tuna for the sashimi market. A combination of longlining and trolling was carried out from a 15 m vessel between January and March. In 34 days of fishing, 24 longline sets of about 180 hooks per set were made. Catch rates averaged 8.2 yellowfin/1000 hooks, 2.3 albacore/1000 hooks and 0.7 bigeye/1000 hooks. Most of the yellowfin (68%) were caught by trolling. All fish were sold as sashimi at fresh-chilled prices.

In a working paper presented to the seventeenth Regional Technical Meeting on Fisheries, Bailey (1985) reported on the history of FAD deployment in New Zealand waters up until February, 1985. Since that time the following deployments and losses have occurred:

1. The three Solander Fisheries buoys deployed on the west coast of the South Island in June, 1984 to attract southern bluefin tuna are no longer in place. It is believed their mooring lines failed. There are no reports of southern bluefin being caught around the buoys in the 1985 season.
2. The seven FADs deployed off the Bay of Islands by two big game fishing clubs have all been lost. However, during the summer of 1985 four of these FADs proved successful in attracting kingfish (Seriola lalandei), dolphinfish (Coryphaena hippurus), rainbow runner (Elagatis bipinnulatus), striped marlin (Tetrapturus audax), blue marlin (Makaira mazara) and yellowfin. Further deployments are planned.
3. The Whangarei Deep Sea Anglers Club deployed two FADs in 90-110 m near the Poor Knights Islands off the northeast coast of the North Island in December 1985. Both FADs are constructed from single 110 litre polypropylene drums. An interesting innovation is the use of 200 kg sections of bulldozer track for the anchors. These have been found to be successful on both muddy and rocky bottoms. Fish species attracted include kingfish, dolphinfish, albacore and several schools of skipjack tuna. At present only one FAD is still in position but there are plans for a further two deployments in November 1986.

The experiences of the three fishing clubs have shown that FADs can be used in relatively shallow water to attract big game fish species. The attraction of skipjack to one FAD, however, is the first indication that FADs may be of importance in commercial fisheries.

Albacore Research in New Zealand

Albacore has been the subject of periodic study in New Zealand since 1968 and results of early studies helped establish the existing domestic fishery. The purpose of present research is to provide information on seasonal distribution, movement and fishing success in relation to oceanic conditions in order to extend the season and area fished. In addition supplementary biological studies are underway to provide information on age and growth, feeding, and fish condition. A number of these studies, in particular those relating to albacore movement, are in co-operation with scientists at ORSTOM (Noumea), SPC, and the U.S. National Marine Fisheries Service (Honolulu and La Jolla).

Our working hypothesis is that albacore caught around New Zealand (by trolling and longline) are part of a single stock, at least part of which moves between New Zealand and sub-equatorial spawning grounds with and in the direction of oceanic and coastal currents. We further hypothesize that the vulnerability of albacore to various fishing gear is due to their depth distribution, which is in turn controlled by surface and subsurface oceanographic conditions and the distribution of forage organisms.

Studies of parasites from troll caught albacore indicate that the fish around New Zealand originate in the tropics (Jones, 1985). Details of albacore movement, however, are at present unknown and justify the co-operative tagging initiative being planned between NMFS, N.Z. FRD, and SPC. Tagging by New Zealand in 1986 and 1987 will concentrate on the west coasts of the North and South Islands to determine whether fish arrive on the fishing grounds from the north and against the flow of coastal currents, or with the eastern zonal flow from the central Tasman Sea. As with NMFS tagging planned for the coming year all fish will be injected with tetracycline so that returns will yield information on growth as well as movement.

The primary goal of tuna surveys is the estimation of oceanographic parameters in relation to albacore catch rate. During the 700 fishing hours thus far completed we have measured salinity and temperature at the surface and at depth and estimated the characteristics of thermoclines and surface thermal fronts as they relate to albacore catch rate. Preliminary analyses suggest that albacore are equally catchable by trolling over the surface temperature range of 17.0 to 19.0°C but that high catch rates are related to thermoclines shallower than 50 m and increase when surface thermal fronts are common. We are continuing our sampling and analyses to determine the relative contributions of surface and subsurface features to catch rate. If surface features are largely responsible for the variation in catch rate it should be possible to develop remote sensing methods for locating albacore water and efficiently siting fishing effort.

During February and March of 1986 we joined with scientists of the U.S.A., France and the Kingdom of Tonga to survey the albacore resource

in the Tasman Sea and along the Subtropical Convergence Zone between N.Z. and 140°W. The results of these surveys are described by Murray et al. (1986) in a separate background paper. This joint survey approach will be extremely important in developing the surface fisheries of the South Pacific. This area will again be surveyed in February and March of 1987 by N.Z., U.S.A. and France using the RV Kaharoa, RV Townsend Cromwell and RV Coriolis, respectively.

Literature Cited

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Table 1. Tuna catches by domestic and foreign licensed vessels fishing within N.Z. waters in 1985.

Species	Domestic (tonnes)*	Southern longline (No. of fish)	Northern longline (No of fish)	Foreign licensed (tonnes)
Albacore	2527	31415	80654	1059
Bigeye	0	10711	4652	561
Skipjack	1075	0	0	0
Southern bluefin	80	25759	28	1720
Yellowfin	1	675	4652	100
Northern bluefin	0	64	0	5
Total tuna	3683	68624	89986	3445

* domestic figures are provisional pending processing of fishing returns filed after the due date.

Table 2. Effort summary for foreign licensed longline vessels fishing within N.Z. waters in 1985.

	Southern longline	Northern longline
Vessels	36	16
Sets	3926	1001
Average No. hooks/set	2891	2728

Table 3. Effort summary for N.Z. domestic tuna fisheries in 1985.

Species	No. of vessels
Albacore	199
Skipjack	43
Southern bluefin	19
Yellowfin	9

Table 4. Catch per 1000 hooks of albacore, bigeye and yellowfin tuna in the Northern and Southern longline fisheries in New Zealand waters since 1980. Data from Murray and Ross (1985), Murray et al. (1984) and from Tables 1 and 2.

Fishery	Species	1980	1981	1982	1983	1984	1985
Southern	Albacore	0.76	1.89	2.97	3.10	3.07	2.77
	Bigeye	0.23	0.33	0.56	0.77	1.19	0.94
	Yellowfin	0.01	0.09	0.09	0.04	0.16	0.06
Northern	Albacore	-	25.09	20.15	38.75	26.66	29.53
	Bigeye	-	2.74	2.30	0.80	0.69	1.70
	Yellowfin	-	1.18	1.02	0.61	0.45	1.70