

**CSIRO**  
DIVISION OF FISHERIES

CRUISE PLAN  
**TT1/92**

CAIRNS TO CAIRNS

5 NOVEMBER – 18 NOVEMBER 1992

CSIRO  
MARINE LABORATORIES

18 JAN 1993

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## Itinerary

Depart Cairns 1600 h Thursday 5 November 1992  
Arrive Cairns 1600 h Wednesday 18 November 1992

## Area of Operation

Tuna aggregation grounds in the western Coral Sea, to the east and north-east of Cairns, 15–18° S, 146–149° E.

## Research background

The *Te Tautai* cruise is jointly funded by ECTUNAMAC and the South Pacific Commission (SPC). As an extension of the SPC's Regional Tuna Tagging Project (a large-scale operation that has released over 120,000 skipjack, yellowfin and bigeye tuna throughout the western Pacific during the past two years), the specific objectives of the Cairns tagging in 1992 are to:

- examine the movement of yellowfin and bigeye tuna within the eastern Australian Fishing Zone and throughout the western Pacific Ocean
- investigate mixing of yellowfin and bigeye tuna from the Coral Sea and the broader western Pacific with yellowfin and bigeye supporting recreational and commercial fisheries off the east coast of Australia
- assess the level of interaction of yellowfin and bigeye tuna fisheries of the east Australian coast and the large-scale purse seine, pole-and-line and longline operations of the western Pacific
- undertake a large-scale marking experiment to provide material for validation of direct age estimates based on interpretation of banding patterns on otoliths, scales and vertebrae
- collect samples for studies of stock discrimination and biology of yellowfin and bigeye tuna
- examine the physical and biological features associated with aggregations of yellowfin and bigeye tuna occurring in the Coral Sea during the full moon periods of October and November, and to study the behaviour of tuna within the aggregations.

## Cruise objectives

- 1 To locate aggregations of yellowfin and bigeye tuna that each year form in the western Coral Sea, by using sea-surface temperature data from satellite imagery (supplied by the Australian Institute of Marine Science) and coordinated searches by the *Te Tautai* and commercial vessels operating in the area. The aggregations are often located above topographic features such as canyons and sea mounts along the edge of the Queensland Plateau and are associated with whale sharks and large flocks of storm petrels.

- 2 Having located the aggregations, to catch tuna with live and dead bait in conjunction with pole-and-line and handlining techniques. All tuna in suitable condition will be tagged with either a single yellow tag (for fish not injected with strontium chloride) or a single orange tag (for fish injected with strontium chloride).
- 3 To conduct a marking experiment on 1000 yellowfin and 1000 bigeye tuna. The experimental fish will be injected with a measured dose of strontium chloride, a benign salt that deposits a mark on their hard parts (otoliths, scales and vertebrae). The marks are used in the validation of age estimates based on interpretation of banding in these structures. All fish injected with strontium chloride will be tagged with an orange tag.
- 4 To examine the diel movement of yellowfin and bigeye tuna, using ultrasonic telemetry.
- 5 To collect samples prey and stomachs for studies of the food and feeding habits of tuna in the aggregations.
- 6 To collect samples of otoliths and tissues for ongoing research into the stock structure of yellowfin tuna in the AFZ.
- 7 To collect gonad samples of ripe female yellowfin tuna for a Queensland Department of Primary Industry study of batch fecundity in the species.
- 8 To collect morphometric data on yellowfin tuna as part of SPC's RTTP biological research program.

### Cruise Plan

*Te Tautai* will leave Cairns and proceed to Arlington Reef (approximately 3 hours steaming), where the vessel will anchor and conduct bait fishing throughout the night. At first light, the vessel will steam north towards Bougainville Reef, where yellowfin and bigeye aggregations were located in 1991. Once in the vicinity of the reef, *Te Tautai* will begin systematic visual searches for surface-orientated tuna schools. When yellowfin and bigeye schools are detected and successfully attracted to the boat, the vessel will begin tagging. Tuna fishing can be conducted only during the hours of daylight. Thus when bait is required, *Te Tautai* will steam into the Great Barrier Reef lagoon at night to collect bait fish, using a bouki ami net and lights.

Wherever possible, the activities of the *Te Tautai* and commercial vessels fishing the aggregations will be coordinated to reduce searching time and assist in determining which schools within the aggregation are of commercial-sized fish.

*Te Tautai* will complete fishing activities on 18 November and steam to Cairns where Australian scientific staff will disembark the vessel will refuel, re-victual and then depart for Noumea.

## Scientific Personnel

John Gunn

Tim Davis

Thor Carter

Wade Whitelaw (to be on commercial vessel/s) for some of the cruise)

David Itano (SPC Cruise Leader)

Kevin Bailey (SPC)

Etimoni Palu (SPC)

## Contact

For further information about this cruise please contact:

John Gunn

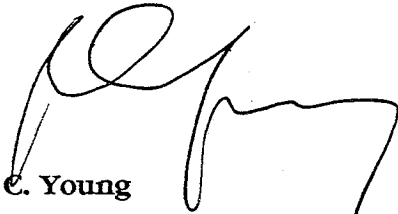
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**P. C. Young**

Chief, CSIRO Division of Fisheries

Date 27/10/89

## Distribution

Normal Distribution

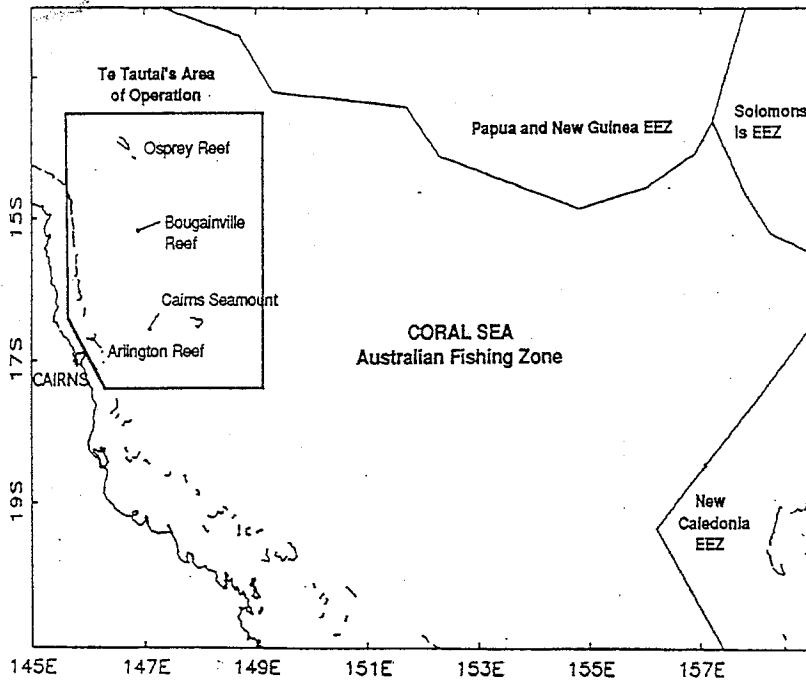


Figure 1. Proposed area of operation for the *Te Tautai* cruise 5–18 November 1992