

CSIRO

MARINE LABORATORIES

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F.V. "Rachel" Cruise Summary R05/84

Northern Pelagic Fish Stock Research Programme

ITINERARY

Depart	Gove	1000 h	Saturday	2 June, 1984
Arrive	Milner Bay, Groote Eylandt	1700 h	Saturday	9 June, 1984
Depart	Milner Bay	1000 h	Sunday	10 June, 1984
Arrive	Milner Bay	1030 h	Tuesday	12 June, 1984
Depart	Milner Bay	1715 h	Tuesday	12 June, 1984
Arrive	Bartalumba bay, Groote Eylandt	2400 h	Tuesday	12 June, 1984
Depart	Bartalumba Bay	1150 h	Sunday	17 June, 1984
Arrive	Karumba	0800 h	Thursday	28 June, 1984

AREA OF OPERATION

Southern Gulf of Carpentaria in inshore and offshore areas between Gove and Karumba.

OBJECTIVES

1. To tag 1000 sharks (principally *Carcharhinus limbatus* and *C. sorrah*), together with *Scomberomorus commerson* and *Thunnus tonggol* as opportunities arise, by gillnetting, handling, longlining and trolling, for studies on stock discrimination, movements, growth rate, mortalities, recruitment and stock sizes.
2. To carry out exploratory fishing (using the standard 1km of 15cm mesh monofilament net) at selected sites within and outside the Taiwanese permitted fishing zone to determine catch rates, species composition, and to collect biological information on sharks, *S. commerson* and *T. tonggol*.
3. To investigate gear selection through mesh selectivity experiments using 10, 15, 20 and 25 cm mesh panels and by comparing catches from gillnet and longline sets.

4. To collect 100 electrophoretic samples from *C. limbatus* and *C. sorrah* in the southern Gulf of Carpentaria in the area between the Vanderlin Islands and Karumba. Electrophoretic samples also to be collected from *S. commerson* and *T. tonggol* as opportunities arise.
5. To retain samples of sharks, *Scorpaenomor* spp., and tuna for market testing.
6. To obtain surface temperature, salinity and turbidity data from fishing sites.
7. To record cetacean sightings and to collect biological information from any dead cetacea taken incidentally in the gillnets.
8. To investigate the effectiveness of flexible plastic tubing in deterring cetaceans from entering the gillnet and to determine the effect of the tubing on shark and teleost catches.
9. To investigate discrepancies in the replication of fork and total length measurements of *C. limbatus* and *C. sorrah* and to investigate freezer induced shrinkage in these species.

PROGRAMME ACHIEVED

1. The 500 m x 15 cm monofilament commercial gillnet was set 40 times. There were 7 sets made with the mesh selectivity net and 7 sets with the longline (60 hooks per set). The rough conditions precluded a greater number of mesh/selectivity or longline sets. Handline fishing (surface and bottom) was carried out daily and trolling was carried out opportunistically, once again limited by the rough conditions.

Booms were fitted to "Rachel" early in the cruise to allow four lines to be trolled at any one time. Two mackerel (*S. queenslandicus*) were caught by this method during the cruise.
2. A total of 961 sharks and 1 mackerel were tagged. Table 1 gives a breakdown by species of the sharks tagged. Very few teleosts were caught.
3. The 500 m x 15 cm mesh gillnet was used for all shots where tagging took priority. Set duration was generally restricted to 15-20 minutes to ensure that captured sharks were in good condition for tagging. Because of the relatively cool water temperatures (less than 25°C), the mesh selectivity net and longline also frequently provided sharks for tagging.
4. Of 40 shots with the tag net during the cruise, 10 shots produced a nil catch. The maximum number in any one set was 101 sharks.
5. Handlining was generally disappointing, with very low catches, ranging from 0 to 11 in any one day.
6. Once again, as with previous cruises, the mesh selectivity net produced poor catches, in spite of generally longer sets (up to 4 hours) than employed on previous cruises. Table 3 gives the total mesh selectivity net catch by panel.

7. One shark tagged on a previous cruise was recaptured: a male *Carcharhinus macroti* (fork length 66.4 cm) tagged off Gove during the first Rachel cruise (R01/84). It had been at liberty for 116 days and was recaptured 28 km from the tagging position. It was released again in good condition. Other recaptures were of sharks tagged in the same or previous sets.
8. Gonad samples were retained and reproductive condition noted for most mature specimens of *C. limbatus* and *C. sorrah* which were not fit for tagging. Mature individuals of other species of shark and mackerel were also dissected and stomach contents examined (sharks).
9. Vertebrae were collected from 89 *C. limbatus* and 69 *C. sorrah*, also from many other sharks dissected (Table 1).
10. Electrophoretic samples were collected from 32 *C. limbatus* and 1 *C. sorrah*. The small numbers are due to very low catches obtained in the Southern Gulf.
11. No cetaceans were captured, though a number of sightings were recorded by D. Hembree, mainly of *Tursiops truncata*.
12. Freezer shrinkage of whole frozen shark was investigated in 40 sharks. For 19 *C. limbatus* frozen for varying periods up to 17 days, the average shrinkage was 1.6 cm in the fork length measurement. For 22 *C. sorrah*, this figure was 1.5 cm.
13. Discrepancies in replication of fork length measurements were investigated for 8 sharks.
14. Five *C. limbatus* and five *C. sorrah* were collected by A. Clark for market research. The sharks were kept for varying lengths of time at ambient water temperature before being killed. Tests are to be performed on the muscle tissue of these sharks to determine how long sharks can remain in the net and still be acceptable for marketing.
15. Surface temperature, salinity, secchi disc and turbidity meter readings were recorded for each fishing station.

COMMENTS

Rough weather and strong winds affected fishing from "Rachel" by restricting fishing locations and frequently precluding the use of longline and mesh selectivity net even in relatively sheltered areas. All fishing was carried out in the lee of islands and peninsulars apart from two days when the weather let up and fishing was possible between the Vanderlins and Mornington Island.

ACKNOWLEDGEMENTS

Working conditions were very difficult due to the weather, and the cruise was extended by four days following a delay in Groote Eylandt caused by engine problems. Many thanks are due to Ian Lew, Pam Canney, Paul Brant and Dave McKenna of "Rachel" and to Andrew Clark, Durant Hembree and Dave Richards - all of whose perseverance and cooperation made for a successful cruise in spite of the obstacles.

PERSONNEL

"Rachel"

Ian Lew (Skipper)
Pam Canney
Paul Brant
Dave McKenna

Scientific

Stephanie Davenport CSIRO (Cruise Leader)
Andrew Clark (N.T. Fisheries)
Durant Hembree (National Parks & Wildlife)
Dave Richards (DPI)

TABLE 1

Summary of catch details

SPECIES	NO. CAUGHT	NO. TAGGED	NO. BIOLOGICALS	VERTEBRAE RETAINED	ELECTROPHORETIC SAMPLES RET.
ELASMOBRANCH					
<i>Carcharhinus limbatus</i>	689	507	106	89	32
<i>C. sorrah</i>	331	245	69	69	1
<i>C. macroti</i>	48	43	4	2	
<i>C. dussumieri</i>	38	21	10	10	
<i>Rhizoprionodon taylori</i>	36	17	0	0	
<i>R. acutus</i>	34	25	3	4	
<i>Sphyrna lewini</i>	16	8	3	2	
<i>C. amblyrhynchoides</i>	13	8	4	2	
<i>C. fitzroyensis</i>	12	12	0	0	
<i>C. amboiensis</i>	6	5	0	0	
<i>S. mokorran</i>	6	4	1	1	
<i>Galeocerdo cuvieri</i>	6	6	0	0	
<i>C. brevipinna</i>	4	4	0	0	
<i>Hemipristis elongatus</i>	3	1	2	2	
<i>R. oligolinx</i>	1	0	*	0	
<i>C. amblyrhynchos</i>	1	1	0	1	
<i>S. blochi</i>	1	1	0	0	
<i>Loxodon macrorhinus</i>	1	0	1	1	
<i>Nebrius concolor</i>	1	1	0	0	
<i>Pristis cuspidatus</i>	4	1	0	0	
<i>Manta sp.</i>	1	0	0	0	
<i>Myliobatid</i>	2	0	0	0	
TELEOST					
<i>Scomberomorus semifasciatus</i>	17				
<i>S. commerson</i>	3	1			
<i>S. queenslandicus</i>	3				
<i>Cobia</i>	2				
<i>Aplocheilichthys niger</i>	2				
<i>Carangoides bucculentis</i>	15				
<i>Eleutheronema tetradactylum</i>	7				
<i>Chirocentris dorab</i>	1				
<i>Scomberoides lyson</i>	2				

* retained

TABLE 2

Percentage tagged by fishing method

METHOD	TOTAL CATCH (NUMBER)	PERCENTAGE TAGGED	NUMBER OF SETS
Handline	46	100.00	-
Longline	50	46.0	7 (420 Hooks)
Tag Net	812	90.5	40
Mesh Selectivity Net	363	43.5	7

TABLE 3

Mesh selectivity net - catch by panel (7 sets)

Mesh size (cm)	Number of fish
10	57 (31)
15	245 (70)
20	52 (20)
25	9 (4)
TOTAL	363

* Numbers in parentheses represent the largest catch in a single set.

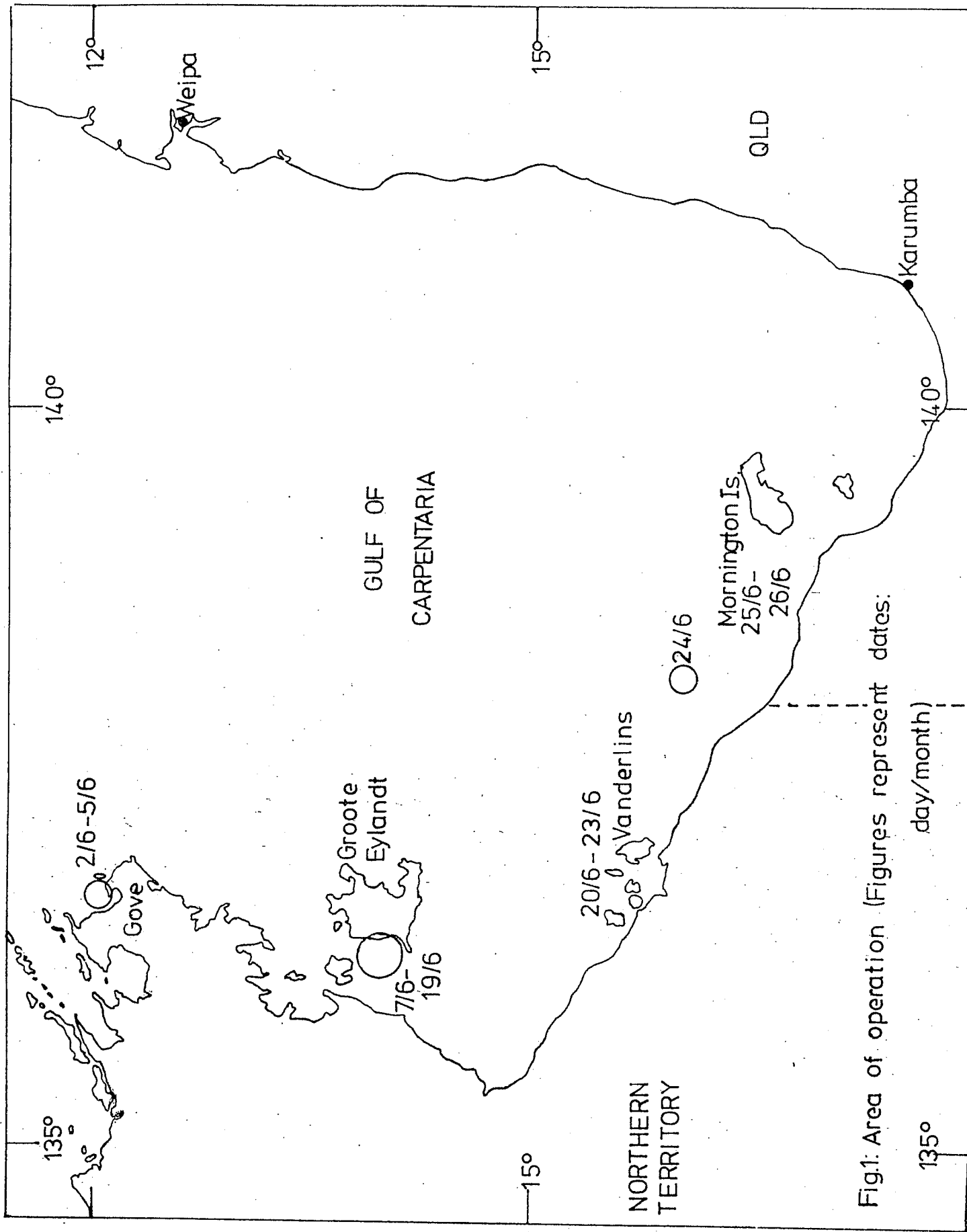


Fig.1: Area of operation (Figures represent dates: day/month)

