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**CSIRO**

**MARINE LABORATORIES**

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22 JUL 1982

VB50/24

**CRUISE SUMMARY**

FRV Soela S02/82

ITINERARY

Departed	Fremantle	1800	20.3.82
Arrived	Pt. Hedland	0800	25.3.82
Departed	Pt. Hedland	1900	25.3.82
Arrived	Pt. Hedland	0830	31.3.82
Departed	Pt. Hedland	0610	1.4.82
Arrived	Pt. Hedland	0710	12.4.82
Departed	Pt. Hedland	1610	12.4.82
Arrived	Pt. Hedland	1600	18.4.82

PRIMARY OBJECTIVES

1. Survey the demersal fishery resources out to 900m depth between longitudes 117°30' and 118°30' east, with particular emphasis on resources beyond the shelf break.
2. Investigate the relationship between species composition and depth.

SECONDARY OBJECTIVES

1. Carry out biological analyses on selected species of lutjanids, carangids, lethrinids, carcharinids, sphyrnids and *Metanephrops*.
2. Carry out experimental fishing for shark at night using gill net and long line (J. Stevens).
3. Collect benthic invertebrates from trawl and dredge samples (L. Marsh, W.A. Museum).
4. Place three current meter moorings at 30°S in depths of 50, 150 and 1000m (F. Boland).
5. Collect mesopelagic fishes and squid at selected stations out to the 1500+ contour (J. Paxton, Australian Museum).
6. Evaluate methods of retaining live specimens of lethrinids for shipment back to Cronulla (R. Martin).

AREA OF INVESTIGATIONS

Untrawlable grounds were encountered east of 117° at depths of 600m and east of 117°30' at depths of 500m. As a result the area of investigations was extended westward of the proposed boundary to 116°20' to include demersal trawls to 700m. No trawlable ground was found at depths greater than 700m between 118°20' so stations at 800 and 900m were not occupied.

DATA COLLECTION

1. Six trawls were made with the Engel high rise demersal net at depths of 50, 100, 150, 200, 300, 400, 500, 600 and 700m. The net was fished hard on the bottom to facilitate the capture of *Metanephrops australiensis*. This was accomplished by replacing the bobbins with rubber punchings. The demersal shots were unaimed and of ½ hour duration. Four additional tows of up to 2 hours duration were made with the Engel high rise. These were aimed shots designed to provide additional specimens of *Metanephrops australiensis* and lutjanids.
2. The Engel 308 was used at night on two occasions to provide collections of mesopelagic fishes and squid. These trawls were made in waters beyond 1000m to depths of approximately 700m.
3. Six trawls were carried out with the 30.5m headline Frank and Bryce to collect live specimens of *Lethrinus nematacanthus*. These trawls were in depths of less than 50m.
4. A number of tows were made with dredges to supplement the collection of benthic invertebrates obtained from trawl samples.
5. Shark fishing was carried out using gill net (1 night) and long line (10 nights). Gill netting operations were abandoned after problems were encountered in its retrieval.
6. Two current meter moorings were deployed. Their positions were:  
 1 NB meter at 25°23.5'S, 112°50.0'E, in 84m depth;  
 1 NB, 1 Aanderaa at 25°21.4'S, 112°18.9'E in 150m depth.  
 The third meter was not deployed because of poor sea conditions. Two satellite buoys were released at 22°42.7'S, 113°22.6'E, in 498m depth and at 18°31'S, 117°37'E, in 380m depth.
7. A 4 hour excursion to Bedwell Island was organised while long lining in the area. A number of fish species were collected from a rotenone station and 3 specimens of *Caranx lugubris*, the first specimens to be lodged in any Australian museum, were obtained by trolling.

DATA COLLECTED

1. A total of 2600 fish specimens representing 512 species were preserved for the Australian Museum fish collections. Over 500 species of teleosts and 54 species of elasmobranchs were collected from trawls. Although the literature on board was limited, it appears a number of the approximately 150 species collected at 500m and below represent new records for northern and western Australia, while some have not previously been recorded from Australian waters. It is not known at this stage whether any represent new species. *Metanephrops australiensis* was trawled at depths of 300 to 500m, with the best catches (6kg/30min) occurring at 400m. Further work with nets designed to catch scampi would be required to determine whether they can be caught in commercial quantities.

2. Scales, otoliths, urohyals, preopercula, vertebrae and anal spines were collected from *Lutjanus vitta*, *L. Sebae*, *L. malabaricus*, *L. erythropterus*, *L. janthinopterus*, *L. argentimaculatus*, *L. russelli*, *L. quinquelineatus*, *Dipterygonotus balteatus*, *Pterocaesio diagramma*, *Pristipomoides multidentis*, *P. typus* and *Symphorus nematophorus*. With the exception of *L. janthinopterus* and *S. nematophorus* at least 60 specimens from each species were either processed on board or, if sufficiently small, frozen and returned to Cronulla. These samples are being used to determine the most useful and convenient structures for ageing within the family Lutjanidae.

Biological data were obtained on 50 *Lethrinus lentjan*, 63 *L. nematacanthus*, 45 *Scolopsis regina*, 40 *Parascolopsis* sp., 4 *Carangoides chrysophrys*, 29 *C. equula*, 29 *C. coeruleopinnatus* and approximately 200 sharks.

3. Long lining for shark was quite successful. Thirteen different species of shark were caught by this method. In addition 2 specimens of broadbill swordfish (*Xiphias gladius*) and 1 specimen each of black marlin (*Makaira indica*) and *Scomberomorus commerson* were meshed. The best catch occurred on the seventh set when 24 sharks were taken for 65 baited hooks in 120m of water.
4. Collections of mesopelagic fishes and squid using the Engel 308 were disappointingly small, although some very interesting material was obtained.
5. Representative samples of cephalopods taken at different depths by the high rise Engel were either preserved in formalin or frozen for subsequent biological examination at Cronulla.
6. Frozen specimens of *Saurida undosquamis*, *Lethrinus chaerorhynchus*, *Nemipterus peroni*, *Lutjanus sebae*, *Abalistes stellaris*, and 8 species of Botulidae were retained for eletrophoretic analysis.

#### COMMENTS

The retrieval of gill nets using a power block mounted amidships proved impractical because of the dangers of fouling the netting on the propellor. This occurred on the first gill netting trial necessitating the stopping of engines, while it was cleared. The restarting of engines resulted in electrical problems and power was only available from one unit. This necessitated a port call and a loss of 4 days cruise time. A second port call was required to land a sick crewman and to repair air conditioning. Despite these delays, all practical objectives were achieved. Thanks are due to the crew and scientific personnel for enabling this work to be completed.

#### PERSONNEL

(Scientific)

Fremantle - Port Hedland (20.3.82-25.3.82)

F. Boland  
A. Pearce

North West Shelf (25.3.82-19.4.82)

T. Davis	(Cruise leader)
J. Stevens	
W. Thomas	
J. Gunn	
R. Martin	
C. Liron	
M. Durack	
P. Adams	(Electronics)
J. Paxton	(Aust. Museum)
M. McGrouther	(Aust. Museum)
L. Marsh	(W.A. Museum)

(Crew)

D. Sheridan	Master
J. Hartley	Mate
G. Bissett	Boatswain
W. Davison	Sen. deck hand
C. Platten	Sen. deck hand
E. Dennett	Sen. deck hand
G. Gayler	Deck hand
R. Higgins	Deck hand
C. Muir	Jun. deck hand
J. Cadosa	Jun. deck hand (off 12.4.82 sick)
J. Batchelor	Greaser deck hand
E. Wilson	C. Engineer (off 12.4.82 personal reasons)
T. Howell	2nd Engineer
L. Bagar	Electr. Engineer
P. Brock	Cook
R. Allshorn	2nd cook

