

# FRV *Southern Surveyor* Cruise Report

North West Shelf Cruise 4/91, 12-30 September 1991

CSIRO Division of Fisheries  
Marine Laboratories  
GPO Box 1538  
Hobart, Tas 7001  
Australia



Telephone (002) 20-6222  
Telex AA 57-812  
Facsimile 24-0530

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## Staff

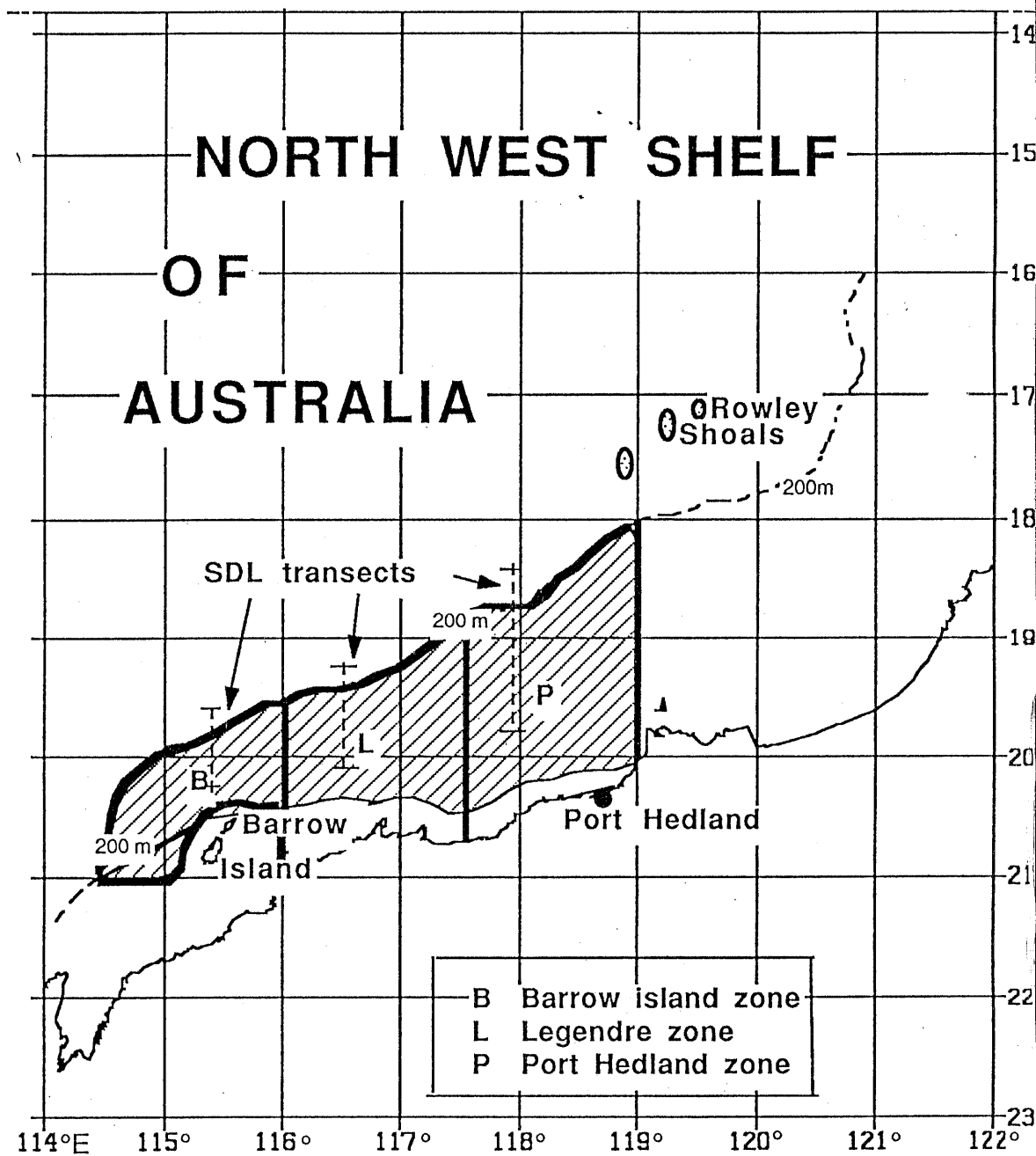
W. Whitelaw (Scientist-in-charge)  
R. Campbell  
D. Cherry  
J. Cordell  
N. Elliott  
A. Smart  
C. Souris  
C. Stanley  
S. Lemmens (University of Western Australia)  
A. Coleman (Department of Fisheries, Northern Territory)  
K. Colgan (Bureau of Rural Resources)

## Duration

Departed Geraldton 1000 h (WST) 12 September (Thursday) 1991  
Arrived Broome 0930 h (WST) 30 September (Monday) 1991

## Locality

The North West Shelf study area, encompassing the three experimental management zones (see attached map).



## Aims

1. To determine the composition of the demersal fish community and the distribution and abundance of demersal habitats (based on epibenthic fauna) in each of the three experimental management zones.
2. To collect data and samples from which the basic population parameters (recruitment, growth and mortality) can be measured.
3. To conduct SDL transects (see attached map)
4. To obtain taxonomic specimens and photographs of North West Shelf fish species.
5. To deploy a current buoy for the CSIRO Division of Oceanography at our farthest point north.
6. To obtain live berried scampi (*Metanephrops* spp.) specimens for larval rearing studies (University of Western Australia)
7. To obtain genetic material for species and stock discrimination studies for a variety of species from the families Synodontidae, Balistidae, Lutjanidae and Lethrinidae.
8. To obtain western rock lobster pueruli (*Jasus novaehollandiae*) for the University of Western Australia.

## Cruise narrative

We departed Geraldton at 1000 h on 12 September and steamed north to the beginning of our study area. During this time the laboratories were set up and all the equipment readied for sampling. From 1900–2000 h we made a plankton tow to try to collect some crayfish larvae for the University of Western Australia; none were obtained.

On Friday 13 September we deployed the CTD to 650 m to ascertain whether the trigger would fire properly at depth. It did not, and will be returned to the agent for repair under warranty.

The random fishing stations began at 0830 h on Saturday 14 September, with six stations being completed. As the cruise was shorter than originally planned, we had to average nearly 6 shots a day to complete the survey.

Trawling was continued on 15 September to the west of the Monte Bello island group, where we successfully completed three stations but badly damaged the nets on two others. The Barrow Island hydro transect was completed on this night.

Trawling continued for the next few days, though a lot of bad ground was encountered around the Monte Bellos and we sustained quite a bit of net damage, which gave the crew, fishing master and bosun plenty of practice in net repairs. Problems were also encountered with the camera frame getting caught and damaging the net on deployment and retrieval (due mainly to the lack of deck space and the steep angle of the stern ramp). The float configuration on the camera frame was changed and some fine mesh added behind the frame to try and alleviate this problem. During this time we were averaging around 6 to 7 shots per day.

Fishing continued until 20 September, when I was requested by the Chief to shorten the cruise by a further five days. Consequently, by working the gear and crew very hard we increased our average number of shots per day to around 7-8. A new record was achieved on 24 September, when 9 shots were completed.

The Hedland SDL transect was completed on 23-24 September. Fishing continued, with an average of 7-8 shots a day. Due to the lack of time for properly repairing the nets and maintaining the electronic equipment, there were a few instances of net and camera failure.

Three scampi shots were completed on the evening of 26 September, though only two berried individuals in good condition were caught alive. On 27 September, one of the Frank and Bryce nets "disintegrated" when brought to the surface — the net came away from both head and ground gear and had to be retrieved by grappling hook. The camera and frame were still attached to the net, so luckily were retrieved. This particular net, while unused before this cruise, was quite old and had obviously weakened over time.

Trawling continued on 28 and 29 September, with the last station being completed by lunch time on the 29th.

We then steamed to Broome while cleaning up and stowing gear.

## Results

**Aim 1.** This was successfully completed, with all of the 105 random station being occupied. Of these, 4 resulted in major net damage and were not repeated, while 1 was repeated after net failure. Catches were identified and weighed by species, with up to 70 species being caught per half-hour trawl. The greatest diversity occurred at the shallower stations.

**Aim 2.** Length-frequency data was successfully collected for 14 species of fish (*Saurida undosquamis*, *Saurida* sp. 2, *Epinephelus areolatus*, *E. rankini*, *Lutjanus vittus*, *L. sebae*, *L. malabaricus*, *Nemipterus furcosus*, *N. celebicus*, *Diagramma pictum*, *Lethrinus choerorhynchus*, *L. nebulosus*, *L. nematacanthus* and *Parupeneus pleurospilus*). Otoliths were collected for 4 of the main species (*L. sebae*, *L. choerorhynchus*, *S. undosquamis* and *N. furcosus*).

The number of fish sampled for otoliths are listed below by species and management zone.

Zone	<i>L. choerorhynchus</i>	<i>S. undosquamis</i>	<i>N. furcosus</i>	<i>L. sebae</i>
Barrow	103	91	152	7
Legendre	200	203	210	98
Port Hedland	137	205	208	67

**Aim 3.** The three hydrographic transects were successfully completed (see chart) with submersible data logger profiles being carried out between 50 and 250 m. The SDL was first calibrated with the CTD.

**Aim 4.** Numerous fish specimens were retained for further taxonomic identification. They will be lodged in the I. S. R. Munro Fish Collection at the CSIRO Marine Laboratories in Hobart.

**Aim 5.** The current buoy was successfully deployed at 17°57.88S, 118°19.18 E on the morning of 28 September 1991.

**Aim 6.** A total of three scampi trawls were completed to obtain live berried scampi for the University of Western Australia. A number of specimens were caught and transported live to Perth.

**Aim 7.** Numerous samples were obtained for stock discrimination studies. These will be analysed back in Hobart.

The 35 mm camera was mounted on the headline of every random trawl and used successfully on a total of 63 stations. Equipment failures and high turbidity water were responsible for the unsuccessful shots.

A video camera was mounted on the trawl net during the last trawl to help ascertain the effects of the trawl on the benthos. This was fairly successful, though the footrope does not always show on the video screen.

### **Further accomplishments and observations**

The first two days of the cruise were spent setting up the labs, calibrating the SDL and CTD and performing some plankton tows. The weather for the first week was moderately rough (west of Barrow island, Force 6-7). Once we moved further east the weather moderated and assumed its tropical mantle. There were numerous whale sightings throughout the cruise.

### **Vessel and gear operations**

The vessel worked extremely well for the duration of the cruise. Only a couple of small problems were encountered.

All of the Division's electronics worked extremely well, though the electronics technician and camera operators were kept busy making running repairs on the cameras and electronic fish measuring boards due to the lack of time for routine maintenance during the cruise.

The main door transponder of the Scanmar flooded on the second day due to a "pinched" O ring. It is hoped that this can be repaired under warranty, but it is doubtful as the unit is 13 months old.

The main electronic scales (sorting room) initially were very inaccurate, though this was rectified and the unit worked extremely well throughout the cruise.

All data were entered onto computer (Macintosh) during the cruise. The logging system was not used as it is not yet finalised and it was easier to use our own computer and data forms.

The cruise was successful in all of its aims. This was directly due to the effort and enthusiasm shown by all the crew and scientists on board, under quite trying conditions due to the shortening of the cruise.

*A. W. Whitelaw*

15.10.91

A. W. Whitelaw  
(Scientist-in-charge)

Date 15.10.91

Initialled *AW*

Distribution — Normal distribution and cruise participants