

DIVISION OF FISHERIES

1995 RESEARCH VESSEL PROGRAM

CRUISE PLAN

**FRV SOUTHERN SURVEYOR
CRUISE SS8/95**

18 AUGUST - 10 SEPTEMBER 1995

CSIRO DIVISION OF FISHERIES
MARINE LABORATORIES
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ITINERARY

DEPART: BROOME 16:00 HRS (WST) FRIDAY, 18 AUGUST 1995

REFUEL: KARATHA 29 AUGUST 1995

RETURN: BROOME 08:00 HRS SUNDAY, 10 SEPTEMBER 1995

AREA OF OPERATION

The Northwest Shelf study area, encompassing the three experimental management zones (see attached chart).

RESEARCH BACKGROUND

CSIRO Fisheries began studying the fisheries of the North West Shelf (NWS) in 1978, just prior to the declaration of the 200nm Australian Fishing Zone. An intensive research program was conducted on the NWS during 1982-83, followed by an actively adaptive or experimental management program between 1986-91. This cruise (1995) is to continue the experimental management program and measure changes in benthos and species abundance in the intervening years.

The program was designed to:

- provide data on the changing structure of the Northwest Shelf fish and epibenthic community;
- improve the estimates of parameters required by existing methods of fisheries analysis; and
- provide the ecological background for development of new concepts in tropical multi-species management.

CRUISE OBJECTIVES

1. 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. Collect data and samples from which the basic population parameters (recruitment, growth and mortality) can be measured.
3. Conduct SDL transects (see attached chart).
4. To obtain taxonomic specimens and photos of Northwest Shelf fish and invertebrate species, particularly those required for the Fish Taxonomy section's *Handbook of Australian Seafood* project.
5. To carry out a 'fish down' experiment.
6. To conduct trawls in deeper water (~ 200m) in an attempt to collect specimens of *Mustelus* species required for a genetic study, and other species of importance to the Fish Taxonomy section's research. These trawls will be done overnight and only if time permits.

CRUISE PLAN

Sampling stations for the first two aims are chosen according to a stratified random design, with 44 stations in the eastern zone, 41 in the middle zone and 20 in the western zone.

The vessel will leave Broome and commence work in the eastern shallow section of the study area, working in an westerly direction. The vessel will then put into Karatha on 29 August for refuelling and scientist transfer. After refuelling the remainder of the random stations will be completed.

A stratified random design will be used to determine survey sampling locations, and these samples will be collected during daylight hours. Data routinely collected from these samples are the weights of each species caught (for determination of community composition) and length frequency of selected species (for determination of relative recruitment, growth parameters and mortality rate). Some samples will also be used to provide otoliths (for determination of length at age, and hence growth parameters).

LENGTH FREQUENCIES

All individuals of the following species:

<i>Saurida undosquamis</i>	118001	<i>Saurida</i> sp. 2	118016
<i>Epinephelus areolatus</i>	311009	<i>E. rankini</i>	311010
<i>Lutjanus vittus</i>	346003	<i>L. sebae</i>	346004
<i>L. malabaricus</i>	346007	<i>Nemipterus furcosus</i>	347005
<i>N. celebicus</i>	347004	<i>Diagramma pictum</i>	350003
<i>Lethrinus choerorynchus</i>	351001	<i>L. nebulosus</i>	351008
<i>L. genivittatus</i> (ex-nematacanthus)	351002	<i>Parupeneus pleurospilus</i>	355004

It may occasionally be necessary to sub-sample *Saurida* sp. 2. *Pristipomoides* sp. will also be measured for W.A. Fisheries.

OTOLITHS

Two hundred otoliths for each of *Saurida undosquamis*, *Nemipterus furcosus*, *Lethrinus choerorynchus* and *Lutjanus sebae* are required from each of the three management zones as well as for *P. multidens*, *P. typus* and *E. multinotatus* for WA Fisheries. The relative frequency of fish lengths sampled for otoliths should be the same as the population length frequency (i.e. proportional sampling). Each fish sampled for otoliths will then be measured, sexed, reproductive status determined

and eviscerated. The weights of the body and viscera (excluding digestive tract contents) will then be determined.

A benthos/fish association photographic survey will be carried out with the camera (Photosea 1000) being attached to the headline for all random trawl stations. These films will be developed on-board.

The SDL transects will be completed as time and location within the study area permit. The easterly and central ones will probably be completed in the first leg and the western transect completed on the second leg.

SDL Stations for transects:

<u>Depth</u>	<u>Barrow</u>	<u>Legendre</u>	<u>Pt. Hedland</u>
50m	20°13.8'	20°07.8'	19°45.4'
	115°31.9'	116°30.1'	117°59.4'
100m	19°41.2'	19°29.0'	19°02.8'
	115°30.0'	116°30.7'	117°58.4'
150m	19°40.0'	19°17.7'	18°44.2'
	115°30.1'	116°30.8	118°00.0'
200m	19°38.6'	19°11.7'	18°36.9'
	115°30.8'	116°30.8'	118°00.1'
250m	19°34.8'	19°09.1'	18°30.0'
	115°30.1'	116°30.6'	118°00.0'

An extra day has been added to the end of the cruise so that the *Southern Surveyor* can carry out a number of replicate trawls over the same position. This will be to assess the impact of repeated trawls on the quantity and composition of fish and benthos.

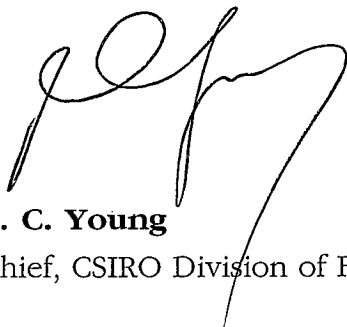
PERSONNEL

W. Whitelaw (Scientist-in-charge)	leg 1	leg 2
C. Stanley	leg 1	leg 2
G. Yearsley	leg 1	leg 2
T. Wassenberg	leg 1	leg 2
A. Graham	leg 1	leg 2
Jerry Jenke (WA Fisheries)	leg 1	leg 2
C. Liron	leg 1	
T. Fisher	leg 1	
J. Cordell	leg 1	
M. Ryba	leg 1	
T. Hay (N.T. Fisheries)	leg 1	
L. McDonald		leg 2
Whale watcher		leg 2
D. Shaw		leg 2
G. Dews		leg 2
S. Cook (Qld Museum)		leg 2

CONTACTS

For further information about this cruise contact:

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P. C. Young

Chief, CSIRO Division of Fisheries

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July 1995

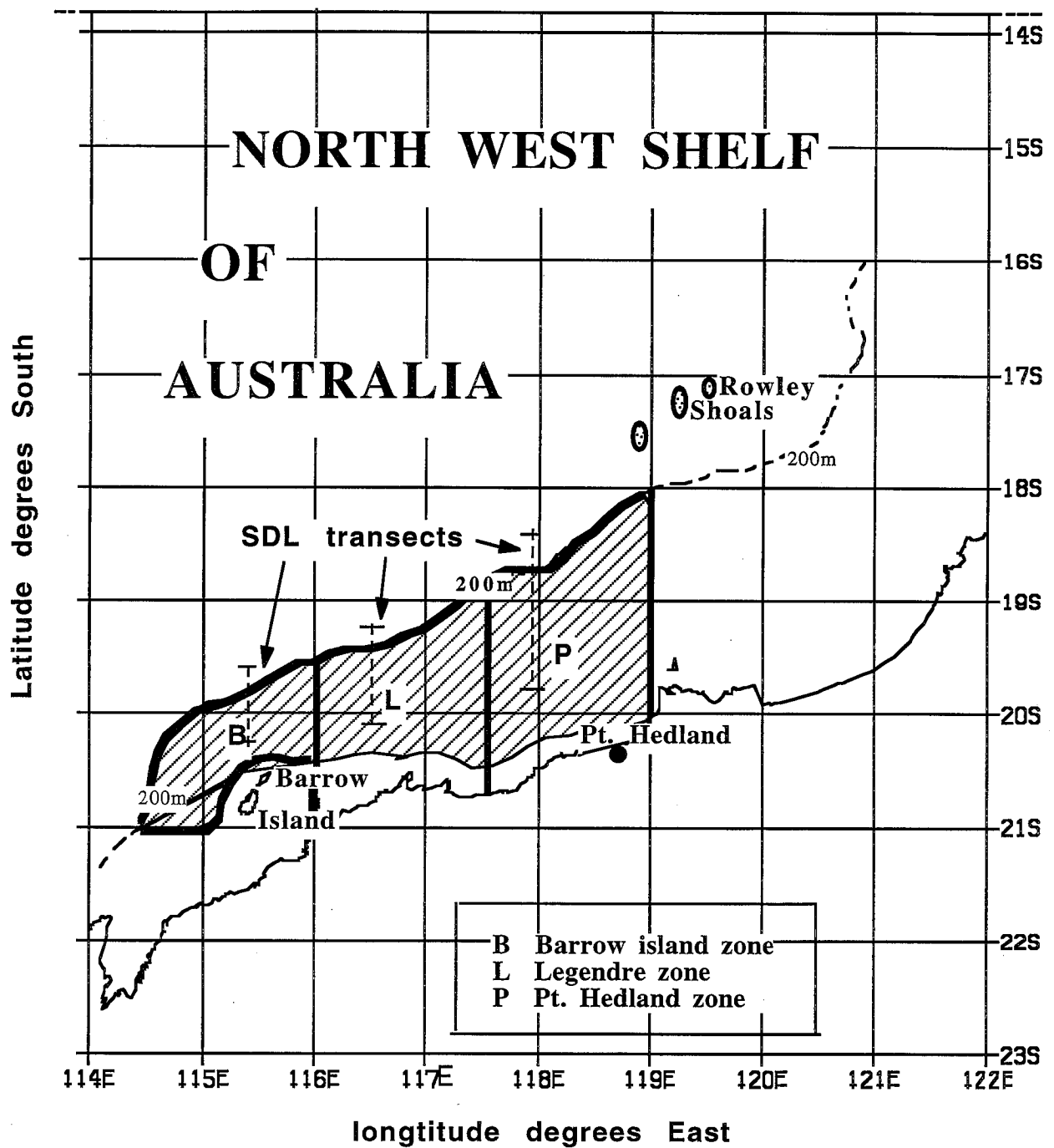


FIGURE 1. NORTHWEST SHELF