

FRANKLIN

National Facility
Oceanographic Research Vessel

RESEARCH PLAN FR 5/95

MASS MORTALITY OF PILCHARDS

Itinerary

Sail Fremantle Tuesday 1800 13 June 1995 WST
Arrive Fremantle Friday 0800 16 June 1995 WST

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Principal Investigators

G. Cresswell, D. Griffin, A. Pearce
CSIRO Division of Oceanography

N. Bax, S. Blackburn, R. Bradford, B. Griffiths, J. Parslow
K. Sainsbury, P. Thompson, J. Young

CSIRO Division of Fisheries:

G. Hallegraef

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WA Fisheries

June 1995

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Background

A mass mortality of pilchards (*Sardinops neopilchardus*) commenced off the Eyre Peninsula (near Adelaide) in March 1995. The 'wave of death' spread in both directions along the coastline, reaching Perth and Sydney in May. A National Task Force comprising scientists from five state fishery authorities, three CSIRO Divisions and several Universities was assembled and various explanations of the deaths were advanced, all subsequently to be retracted as more information became available.

The dead fish are all 3 year old adults and present characteristic symptoms of red bloated gills, suggesting death by suffocation. Blooms of various phytoplankton are associated with the deaths, and a herpes-type virus has been tentatively associated with dead fish, but not with healthy fish. Stronger than normal upwelling was observed when and where the initial outbreak occurred, but not elsewhere. The spread of the kills has been faster than the speed of local currents, and in fact in the opposite direction.

On this short cruise we will attempt to overcome one of the major obstacles to progress on this issue; a lack of comprehensive physical and biological data from the vicinity of the fish deaths. We will bring the full investigative capacity of the *Franklin*, Marine Laboratories and collaborators to bear on the problem, but recognize that this will only provide a portion of the data that will probably be needed to solve the mystery.

Precis

The ship will survey the shelf waters off Fremantle and 100 km northwards, sampling the current velocity, hydrography (temperature, salinity, dissolved oxygen, fluorescence, chlorophyll, nutrients), phytoplankton, micro- and macro-zooplankton communities and pilchard eggs, ahead, at and behind the front of the kills.

Research Plan

We will first repeat the 30 nm Marmion line of FR 11/94 along 32°S, first outwards with only the ADCP sampling, then back in carrying out stations at 3.3 nm spacing. This will document conditions near Rottnest Island where kills are still occurring. Ten stations will be occupied on the transect. Each station will take 1.5 hours and comprise a CTD cast, a phytoplankton net, a CalCofI vertical tow for pilchard eggs, a 20 min obliquely towed bongo net and surface nets for zooplankton. Adult pilchards will be obtained from commercial purse seiners in the vicinity of Rottnest Island.

Depending how far north kills have progressed by 13 June, we will steam up to 12 h northwards (to approx 30°S) and repeat the first line. Remaining time will be spent sampling intermediate locations on the way back.

If high scattering layers are detected by the ADCP, or fluorescence maxima are detected by the CTD, attempts will be made to target these with the nets. Sampling will also be guided by the most recent AVHRR image available.

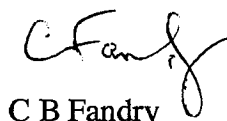
Equipment

ADCP, CTD with 12 bottle rosette and fluorometer, thermosalinograph,
100 micron drop net, 500 micron bongo and surface ring nets.

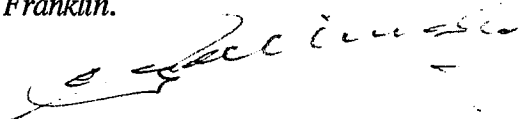
Personnel

David Griffin	CSIRO Oceanography	Chief Scientist
Alan Pearce	"	
David Berry	CSIRO Fisheries	
Russell Bradford	"	
Tim Lamb	"	
Peter Thompson	"	
Ken White	WA Fisheries	
David Vaudrey	CSIRO - ORV	Cruise Manager,
Erik Madsen	"	
Robert Griffiths	"	

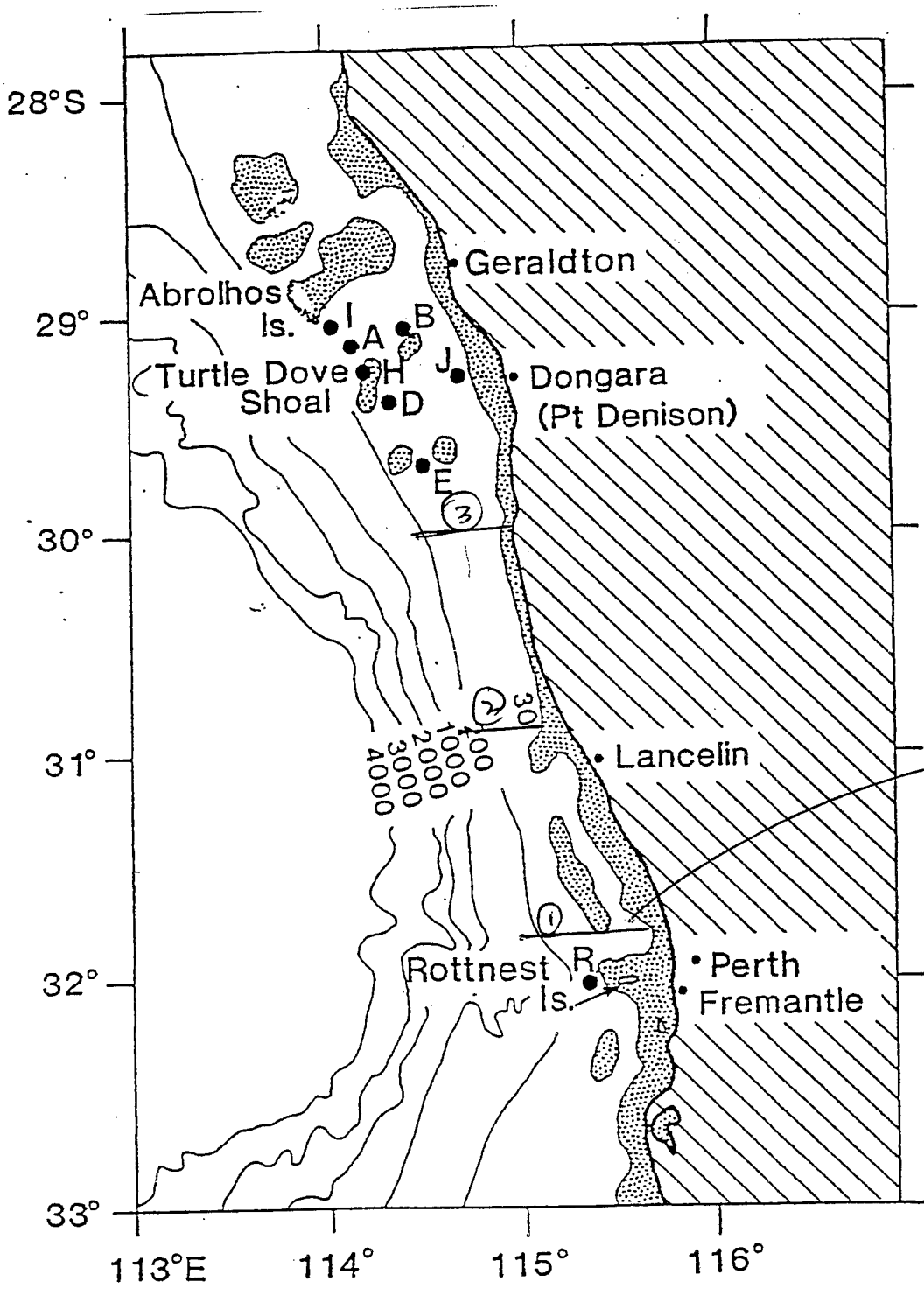
This Research Plan is in accordance with the direction of the National Facility Steering Committee for the oceanographic research vessel *Franklin*.



C B Fandry
CSIRO Division of Oceanography



G W Paltridge
National Facility Steering Committee



①
 repeat
 Marmion line
 of Feb 11/94
 Fig. 1.
 1/3 mile
 station
 spacing between
 20 or 30 m and
 300 m