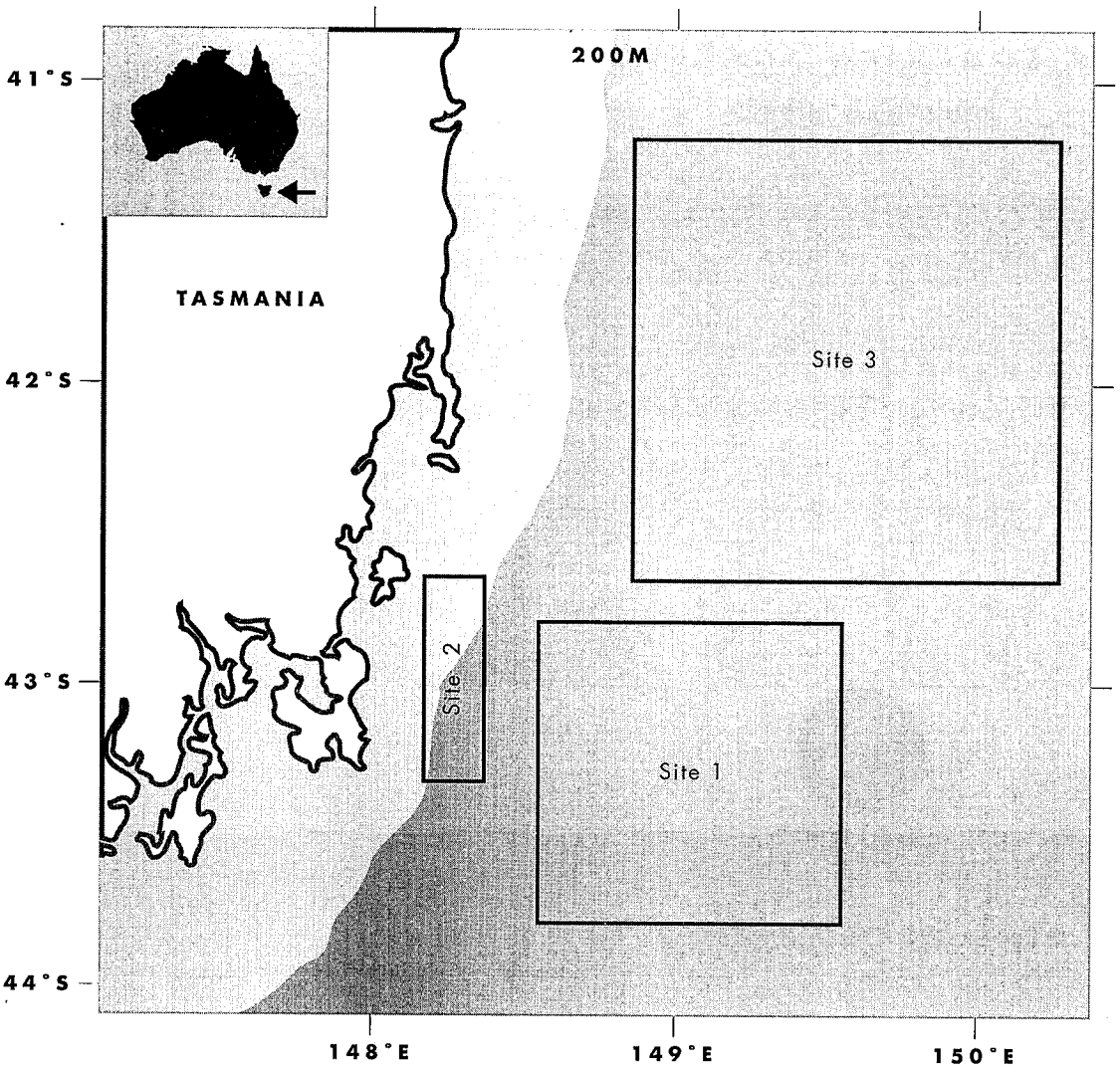
FRV *SOUTHERN SURVEYOR*

June 1 – June 21 1993

CSIRO
AUSTRALIA

DIVISION OF FISHERIES

CRUISE PLAN SS 4/93



MAP: Main study areas on Cruise SS 4/93, Legs 1 and 2

PRELIMINARY

A cruise is scheduled with two Legs to southeastern Tasmanian waters. Leg 1 will study the effects of jarosite dumping on marine fauna and Leg 2 will study the physical and biological structure of the waters of the southern bluefin tuna fishing grounds. Both cruises continue earlier studies recorded in Cruise Report SS 2/92.

LEG 1

Departure: 0900, June 1, 1993. Return: 1200, June 12, 1993, a total time of 12 days. If delayed by bad weather the ship will return to Hobart no later than 1200, June 15.

The cruise will operate in southeastern Tasmanian waters in the vicinity of the jarosite dumpsite (see Site 1 on map). This is the second and final study commissioned by Pasminco Electrolytic Zinc Pty Ltd to examine the effects of (Commonwealth - licensed) jarosite dumping on the marine fauna of the area. Data collected on this cruise will augment and compare data collected on cruise SS 2/92 completed in June 1992.

OBJECTIVES ARE TO:

1 Describe the physical oceanography of the waters of the dumpsite (via CTD transects in and around the dumpsite) and to measure zooplankton biomass and chlorophyll a.

2 Determine the species composition and day/night vertical distribution of midwater fauna using stratified midwater trawls.

3 Determine the day/night vertical distribution and species composition of the zooplankton.

4 Collect demersal and pelagic species (identified as key species during the 1992 cruise) for heavy metal analysis.

CRUISE PLAN

The three transects made in June 1992 will be repeated: a west to east transect at 43°S; a northeast to southwest transect through the dumpsite; and, a north to south transect at 149°E.

After leaving Hobart, FRV *Southern Surveyor* will proceed to 43°S for the first transect. The further two transects will extend beyond those of the previous cruise. Five CTD casts at approximately 10 nm intervals are planned. Vertical drop nets will be deployed following each cast. The work will be timed so that two of these stations sample for zooplankton and midwater fishes at night. Zooplankton will be sampled with the EZ net (350 mm mesh) at four depth strata (100, 200, 300 and 400 m) from 400 m to the surface. Replicate surface tows will be timed to coincide with each strata sampled. The complete tow will take approximately two hours, and will take place at night. This will avoid dawn and dusk, which are the times of greatest vertical movement of zooplankton. Midwater fishes will be sampled with the opening/closing codend system attached to the IYGPT net twice on each transect. Depth strata sampled will be the same as for the EZ net. Each strata will be sampled for 20 min. At the dumpsite 24 h sampling will be taken to gather information on vertical distribution. Two days will be set aside for demersal trawling.

The FRV *Southern Surveyor* will then return to Hobart to exchange personnel. In case of bad weather, up to three additional days are allotted to complete the objectives.

LEG 2

Departure: 0900, June 13, 1993 (June 16 if delayed by a late return of Leg 1). Return: 1200, June 21, 1993.

The cruise will operate east of Tasmania in Sites 2 and 3 (see map) where the Japanese longline fishery and Hippolyte Rocks are located.

This cruise continues the study of the physical and biological structure of the waters of the southern bluefin tuna fishing grounds off eastern Tasmania begun on Cruise SS 2/92. This study will focus mainly on the fishing grounds of the offshore longline fishery, but will also sample the waters of the inshore trolling fishery around the Hippolyte Rocks. The biological productivity will be quantified on fine and broad scales to further understanding of the factors affecting aggregations and growth of tuna.

OBJECTIVES ARE TO:

1 Describe the physical oceanography around the Hippolyte Rocks.

2 Determine the species composition of the midwater and zooplankton fauna around the Hippolytes.

3 Map the physical oceanography of the area east of Tasmania in which the Japanese longline fishery is located.

4 Investigate, using micronekton and zooplankton trawls, the biological production in these waters in relation to the position of the longline fleet.

5 Liaise with inshore fishermen and longline observers to collect tuna stomachs for comparison of gut contents with net captures.

THE SECONDARY OBJECTIVE IS TO:

– Begin investigations of the distribution of ichthyoplankton in relation to the major water masses off eastern Tasmania.

CRUISE PLAN

HIPPOLYTE STUDY: The cruise will proceed from Hobart to the Hippolyte Rocks area (Site 2) to augment data on the physical oceanography and biological production gathered in 1992. Two seacat/CTD transects (one cross shelf and the other long shore) will be made to map the physical structure and biological production of the area. At night, EZ tows followed by midwater trawling will examine the spatial distribution of midwater fauna around the Hippolytes. Time allocated is two days.

SURVEY OF TUNA GROUNDS: The FRV *Southern Surveyor* will steam east to the area of Site 3 to establish the main area in which the Japanese longline fleet is located. Following procedures worked out in 1992, this will be done through communication with the Australian Fisheries Management Authority (AFMA) and CSIRO Marine Laboratories in Hobart. The cruise will then transect through the area using the seacat profiler, CTD, underway thermosalinograph, nutrient recorders, and drop nets to establish a picture of the major oceanographic features and their relationship to the fishery. The bathymetry will be monitored using the EK 400 to examine whether the position of the fleet and oceanic variables are associated with the topography of the ocean bottom. Three main stations, one inside the warm pool, one outside in the cold water

and one at the boundary between the two will be occupied to compare the productivity and fauna of the three regions. At each station we will complete replicate tows with the EZ and IYGPT nets to 400 m during night time. CTD casts to 1000 m will be made at the beginning and end of each station. Time allocated is five days. Should the weather be bad, time will be cut from the main transect to ensure that the three main stations (inside the East Australian Current, outside and at the edge) are completed. The return to Hobart will take one day.

PERSONNEL

All personnel are staff of the CSIRO Division of Fisheries unless otherwise indicated:

Mr. Jock Young (Cruise Leader)
Dr. Vincent Lyne
Mr. Dave Wright
OMS
Mr Barry Bruce (Leg 2 only)
Dr. Bill Wilson, Pasminco EZ (Leg 1 only)

Dr. Clive Stanley (Assistant Cruise Leader)
Mr. Randall Gray (Leg 1 only)
Mr. Tim Lamb
OMS
Mr. Jeff Cordell
Mr John Aoki, AFMA (Leg 2 only)

CONTACTS

For further information, please contact:

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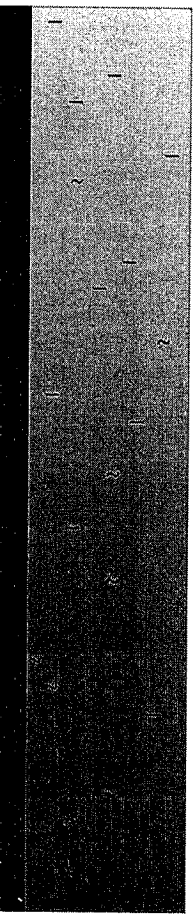
DISTRIBUTION

Normal distrtibution and cruise participants
Russell Reichelt, BRS
Peter Cassells, AFMA
Bill Wilson, Pasminco EZ
Robin Gimor, Pasminco EZ

APPENDIX 1: CRUISE TIME ESTIMATES

ACTIVITY	TIME (HOURS)
LEG 1	
– Steaming to and from study area	24
– Five individual transect times:	
steaming 10 h	
ctd 5 x 2 h	
midoc 2 x 4 h	
EZ 2 x 4 h	
Transects 1 to 5 as above	180
– Demersal trawling	48
– Day/night study at dumpsite	36
TOTAL	**288 (12 days)**
Bad weather allowance	72 (3 days)
LEG 2	
– Hippolyte study	24
ctd sampling 12 h	
trawling 12 h	
– Transects (x 2)	48
steaming 8 h	
ctd sampling (x 6) 16 h	
– Station 1	24
steaming 7 h	
ctd 5 h	
trawling 12 h	
– Stations 2 and 3 as above	48
TOTAL	**144 (6 days)**



P. C. Young
Chief, Division of Fisheries

Date: 18/5/93