

J. Stevens

CSIRO DIVISION OF FISHERIES

1992 Research Vessel Program

Cruise Plan

FRV Southern Surveyor

Cruise SS2/92

26 May – 18 June 1992



CSIRO Division of Fisheries
Marine Laboratories
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Australia

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Itinerary

Depart Hobart:	0900 h 26 May 1992
Arrive Hobart:	1200 h 3 June 1992
Depart Hobart:	1700 h 3 June 1992
Arrive Hobart:	1500 h 18 June 1992

Area of Operation

Leg 1:

Southeast of Tasmania within latitudes 43° and 44° S and longitudes 148° and 149° E (see Fig. 1).

Leg 2:

East of Tasmania in the area of the Japanese longline fishery and the Hyppolyte Rocks (see Fig. 1).

Research Background

Since 1973 EZ has been dumping jarosite continuously at a deepwater (2000 m) station southeast of Storm Bay, Tasmania. In response to concern over the effects of this dumping on the local environment CSIRO has proposed to make a preliminary investigation of the physical and biological structure of the waters of the dumpsite. This work is intended to precede a more intensive analysis of the effects of this dumping on the local marine fauna to be carried out in 1993. Six days have been contracted for this years work.

Once this work is completed we intend to begin a study of the physical and biological structure of the waters of the southern bluefin tuna fishing grounds off eastern Tasmania. Although this study will focus mainly on the fishing grounds of the offshore longline fishery we will also sample the waters of the inshore trolling fishery, particularly around the Hyppolyte Rocks area. We aim to quantify the biological productivity on fine and broad scales in these areas to further our understanding on the factors affecting aggregations and growth of tuna.

Cruise Objectives

Leg 1:

1. Describe the physical oceanography of the waters of the dumpsite via CTD transects in and around the dumpsite. Measurements will also be made of zooplankton biomass and chlorophyll a in the study area.

2. Determine the species composition and day/night vertical distribution of midwater fauna of the dumpsite from stratified midwater trawls.
3. Determine the day/night vertical distribution and species composition of the zooplankton of the dumpsite.

Leg 2:

1. Make preliminary investigations of the physical oceanography around the Hyppolyte Rocks area off eastern Tasmania
2. Determine the species composition of the midwater fauna around the Hyppolytes.
3. Determine the species composition of the major zooplankton taxa around the Hyppolytes.
4. To map the physical oceanography of the area east of Tasmania in which the Japanese longline fishery is located.
5. To make preliminary investigations of the biological production in these waters in relation to the position of the longline fleet via micronekton and zooplankton trawls.
6. To liaise with inshore fishermen and longline observers to collect tuna stomachs for comparisons of gut contents with net captures.
7. Deploy satellite drifter buoy to investigate long term movements of ocean currents in the area.

Cruise Plan

Leg 1:

To examine the physical oceanography and midwater fauna of the waters of the dumpsite (site 1 in Fig. 1) three 60 nm transects are planned; a west to east transect at 43 °S, a north east to southwest transect through the dumpsite, and a north south transect at ~ 149°E. The vessel will depart Hobart and proceed along the shelf break to 43 °S to begin the first transect. On each transect we will aim to complete 10 CTD casts at approximately 6 nm intervals. Vertical drop nets will be deployed following each cast. Our work will be timed so that at two of these stations we can sample for zooplankton and midwater fishes at night. Zooplankton will be sampled with the EZ net (350 mm mesh) at nine depth strata (50, 100, 150, 200, 250, 300, 400, 500 and 600 m) from 600 m to the surface. Replicate surface tows will be timed to coincide with each strata sampled. The complete tow will take approximately 4 h, and will be carried out at night avoiding dawn and dusk,

which are the times of greatest vertical movement of the zooplankton. Midwater fishes will be sampled with the opening/closing codend system attached to the IYGPT net. Four depth strata from 900 m to the surface will be sampled day and night. Each strata will be sampled for 45 minutes. At the dumpsite we will carry out a 24 h day/night sampling to gather information on vertical distribution. Our sampling strategy is designed to complement previous midwater sampling on SS1/92. Once completed we will steam to Port Arthur to exchange personnel. Time 8 days.

Leg 2:

Hyppolyte study

From Port Arthur we will steam directly to the Hyppolyte Rocks area (site 2 in Fig. 1) to study the physical oceanography and biological production of the area. Two Sea Cat / CTD transects, one cross shelf and the other long shore, will be carried out on consecutive days, to map the physical structure and biological production of the area. Each night an EZ tow, followed by midwater trawling will examine the spatial distribution of midwater fauna in the vicinity of the Hyppolytes. Once completed, replicate plankton tows will be made with the EZ opening/closing net over 24 h to examine day/night variations in the depth distribution of the zooplankton. Time 3 days.

Broad scale survey of tuna grounds

When completed we will steam east to the area in which the Japanese longline fleet is located (site 3 in Fig. 1). Historically the position of the longline fleet is generally associated with the convergence of northern East Australia Current water and Subantarctic water. Consequently there is considerable variation in the position of the fleet during the fishing season and from year to year. Therefore, our initial task will be to establish the main area in which the fleet is located. This will be done through communication with the Australian Fisheries Service and CSIRO Marine Labs. We will make transects through the area making use of the seacat profiler, CTD and underway thermosalinograph and nutrient recorders and drop nets to establish a picture of the major oceanographic features and their relationship to the fishery. We will also monitor the bathymetry using the EK 400 to examine whether the position of the fleet and/or oceanic variables are associated with the bottom topography. Specifically, this will involve an initial 60 nm west to east transect of 10 CTD stations followed by five 30 nm transects spaced along the feature. Five CTDs are planned on each of these transects. Time 4 days.

Fine scale study

The likely scenario is that the fleet will be associated with either a frontal feature or eddy. Once we have established the position of the feature we will make two transects, one parallel with, and the other perpendicular to, the

direction of the feature. On these transects we will carry out a set station procedure which, depending on the station, will be as follows:

Short station: CTD cast or seacat profile (with fluorometer) followed by drop net

Long station: As above plus EZ cast to 500 m.

Night station: CTD cast or seacat profile followed by midwater trawl to 500 m.

Ten stations are planned at regular intervals along each transect. Long and night stations are planned for the beginning, middle and end of the transect. Plankton and midwater tows will be made above and below the thermocline. Time 3 days.

As the fishing fleet is usually spread geographically we aim to repeat these transects at a site which also shows marked oceanographic features. Time 3 days.

Two days are set aside for bad weather, and one day to return to Hobart. Time 3 days.

Personnel

(Note: unless indicated otherwise, all personnel are staff of the CSIRO Division of Fisheries)

Leg 1:

Mr. Jock Young (Cruise leader)
Dr. Clive Stanley
Dr. Vincent Lyne
Mr. Dave Wright
Mr. Thor Carter
Mr. Garry Critchley
Mr. Bob Griffiths
Mr. Mark Lewis
Mr. Jeff Cordell
Dr. Bill Wilson (Pazminco EZ)
Mr. David Mitchell (Pazminco EZ)
Mr Keith Saunders

Leg 2:

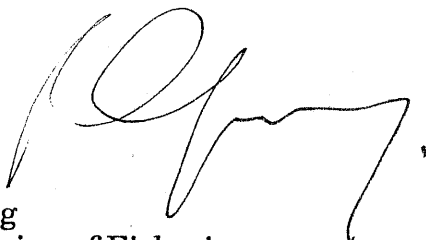
Mr. Jock Young (Cruise leader)
Dr. Clive Stanley
Dr. Vincent Lyne
Mr. Dave Wright
Mr. Thor Carter
Mr. Garry Critchley
Mr. Bob Griffiths
Ms. Naomi Clear
Dr. Tim Davis
Mr. Matt Sherlock

Contacts

For further information about this cruise contact:

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P. C. Young
Chief, Division of Fisheries

Date

14 May 1992

Distribution:

Normal distribution and cruise participants
Peter Ward (AFS)
Peter Cassells (AFMA)
Martin Exel (AFS)

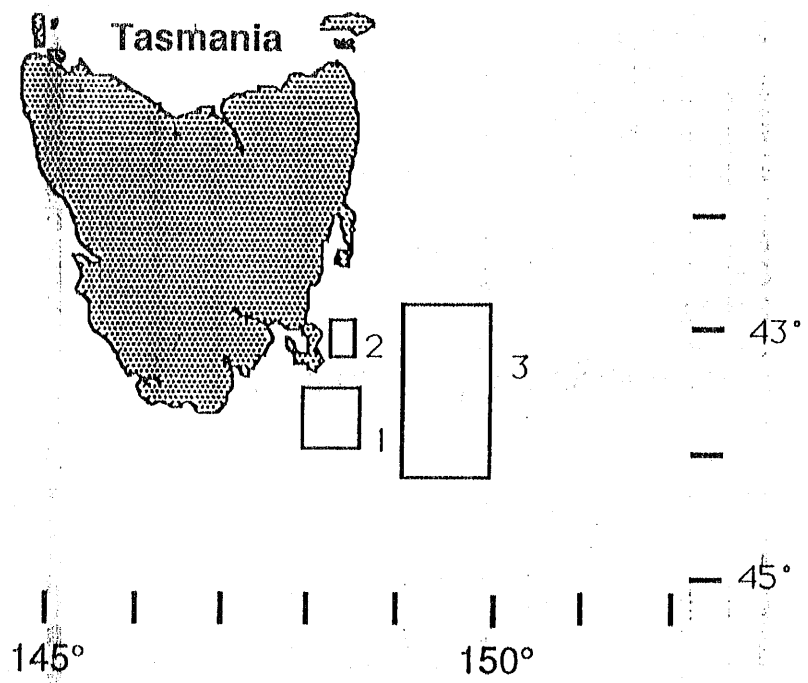


Figure 1 Study Area