

**MINISTRY OF AGRICULTURE, FISHERIES AND FOOD
FISHERIES LABORATORY, LOWESTOFT, SUFFOLK, ENGLAND**

1995 RESEARCH VESSEL PROGRAMME

REPORT: RV CORYSTES: CRUISE 12b

STAFF: J D Metcalfe (SIC)
B H Holford
B F Riches
A A Buckley
M O Eagle
S R J Lovewell

DURATION: 6-21 DECEMBER

LOCALITY: Southern North Sea

AIMS:

1. To release 50-100 plaice equipped with electronic data storage tags, and similar numbers of control fish tagged with Petersen tags.
2. To track migrating plaice equipped with long-life transponding acoustic tags and to estimate their swimming speed and orientation by simultaneous use of the sector scanning sonar and acoustic Doppler current profiler (ADCP).
3. To track plaice equipped with attitude sensing acoustic transponding telemetry tags in order to assess how much of the time plaice spend swimming horizontally when in mid-water. This information is needed for the compass tag development programme
4. To test methods of releasing acoustically tagged cod at sea from new "beehive" cages prior to undertaking a cod tracking programme as part of MF0130.

NARRATIVE: (All times are Greenwich Mean Time)

CORYSTES sailed at 2005 h on 6 December and proceeded overnight to a position just east of the Outer Gabbard at about 52° 02'N, 02° 15'E. After brief tag trials the following morning, fish tracking commenced at 1050 h with the release of a 44 cm female plaice (E69 7086) at 52° 02.64'N, 02° 14.89'E. This fish was tracked moving north for almost 4 h until it was lost among sand ridges. A search continued for 4 h but was finally abandoned at 1825 h. A second female plaice (E69 7061, 41 cm) was released at 52° 09.54'N, 02° 29.07'E at 2111 h the same day and tracked until 0825 h on 10 December. The fish was abandoned at 52° 15.07'N, 02° 30.33'E having made no substantial excursions into mid-water and having moved only 10.4 km in 59 h.

CORYSTES subsequently steamed west southwest to 52° 09.77'N, 02° 03.35'E to deploy DFR and commercial data storage tags on a rig (deployed at 1136 h). Subsequently, a third female plaice (E69 7037, 39 cm) equipped with a long-life acoustic tag was released at 52° 09.78'N, 02° 05.14'E at 1343 h on 10 December. Although moving only 2.8 km, this fish was tracked until 0810h on Thursday 14 December when tracking had to be abandoned (at 52° 10.74'N, 02° 07.12'E) due to bad weather and worsening sea conditions. All fish tracking on 14 and 15 December was suspended due to continuing easterly gales.

The weather moderated a little on 16 December and sea tests of the new "beehive" cod cages were undertaken. CORYSTES subsequently steamed to a position just south of Smiths Knoll and, as the weather moderated further overnight, fish tracking recommenced on 17 December. A fourth female plaice (E69 7090, 43 cm) was released at 52° 39.92'N, 02° 16.17'E at 0940 h and tracked until it was abandoned at 52° 31.66'N, 02° 18.38'E at 2330 h on 20 December when tracking ceased.

CORYSTES finally docked at 0740 h on 21 December.

RESULTS:

1. *Release of tagged fish.* This Aim was postponed due to a lack of live plaice.
2. *Fish tracking.* Four adult female plaice (Fish 1 to 4) fitted with long-life acoustic tags were followed for periods of 4, 59, 91 & 86 hours respectively. Of these, Fish 1 was lost amongst sand ridges shortly after release. Fishes 2 & 3 made no prolonged movements into mid-water, swimming instead close to the sea bed for short periods. Fish 2 moved 10.4 km to the north whilst Fish 3 moved 2.8 km to the northeast. Fish 4 however firstly moved east 3.1 km across the sea bed, then moved 42.6 km north by selective tidal stream transport on 3 consecutive north-going tides, remained on the sea bed for the fourth north-going tide, and finally moved south 58 km on the next 3 consecutive south-going tides (Figs. 2 & 3).

The long-life tags worked extremely well with the new Systems Engineering sonar, giving clear signals out to over 350 m. Measurements of the speed and direction of the tidal streams were made with the ADCP almost continuously during the tracks of these fish. Although the improvements made to "Sextant" reduced the tracking problems associated with interference from the ADCP, synchronisation between the ADCP and the sector scanner would markedly improve the situation. Since plaice 2 & 3 did not come into mid-water for any prolonged periods, no meaningful estimates of swimming speed or orientation can be made for these fish. However excellent data for calculating swimming speed or orientation were gathered during the track of plaice 4.

One of these plaice (Fish 4) was tagged at sea with a new design of acoustic tag "saddle" which was fabricated from the tag wire itself (Fig 1). This design presented a much reduced profile compared with the epoxy or Perspex saddles used previously.

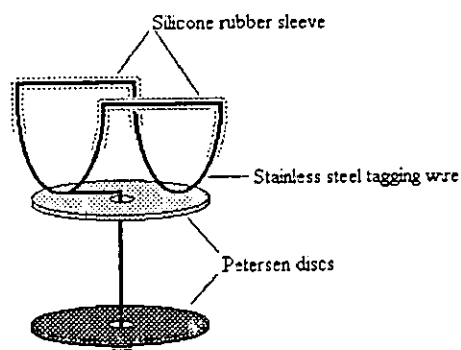


Fig. 1 "saddle" used for mounting acoustic tags.

Throughout tracking, a modified version of "Sextant" was displayed on a screen in the scanner console. This version automatically updated the position of the fish relative to the ship in response to clicking on the target on the scanner screen with the mouse. This made tracking much easier than had previously been the case.

3. *Tests with attitude sensing acoustic tag.* This tag was not available for the cruise.
4. *Tests with new "beehive" cod cages.* Two untagged cod were successfully released from two new similar, "beehive" design, cod cages (one fish from each cage). A number of relatively simple modifications to the cage base (fabricating it from marine ply and adding an inner 10 cm lip) were identified which would improve their operation. Although some modifications to improve the operation of the solenoid release mechanisms had been carried out by the electronic engineers as a result of preliminary tests carried out earlier in the cruise, a need to redesign the solenoid release mechanisms was also identified.
5. *Tests of DFR and commercial data storage tags.* (additional aim carried out for FSM1 in support of NRA contract).

The "macro" DFR data storage tag fitted with a light sensor, together with: a Mk I DFR pressure and temperature sensing data storage tag; a Vemco DFR pressure and temperature sensing data storage tag; a Northwest Marine Technology light, pressure and temperature sensing data storage tag; and a Wildlife Computers light, pressure and temperature sensing data storage tag were successfully deployed on the sea bed in order to compare their performance. About 30h after the rig had been deployed, CORYSTES received a call (at 1625 h on 11 December) from the skipper of local fishing boat (Sophia Dawn) to say that he had fouled his propeller on the DST rig line (despite having seen the buff, he had not altered course because he was shooting fishing lines). Although initially believing that the line to the rig had been cut, we were subsequently informed that the DST rig had been towed back to Lowestoft by the fishing boat. All the data storage tags were recovered intact and working properly.

JD Metcalfe
21 December 1995

SEEN IN DRAFT: B J Chapman, (Master)
W M May (Senior Fishing Mate)

INITIALLED: GPA

DISTRIBUTION:

Basic list +
J D Metcalfe
B H Holford
B F Riches
A A Buckley
M O Eagle
S R J Lovewell
Clerk, Eastern Sea Fisheries Committee
Foreign and Commonwealth Office

FIGURE CAPTIONS:

Figure 2. The ground track of plaice 4 (43 cm, Petersen tag No. E69 7090) which moved 42.6 km to the north, and then returned 58 km south, by selective tidal stream.

Figure 3. The vertical track (7 point running mean with bottom contact preserved) of Fish 4 (fish: — ; sea bed: -----).

Fig. 2

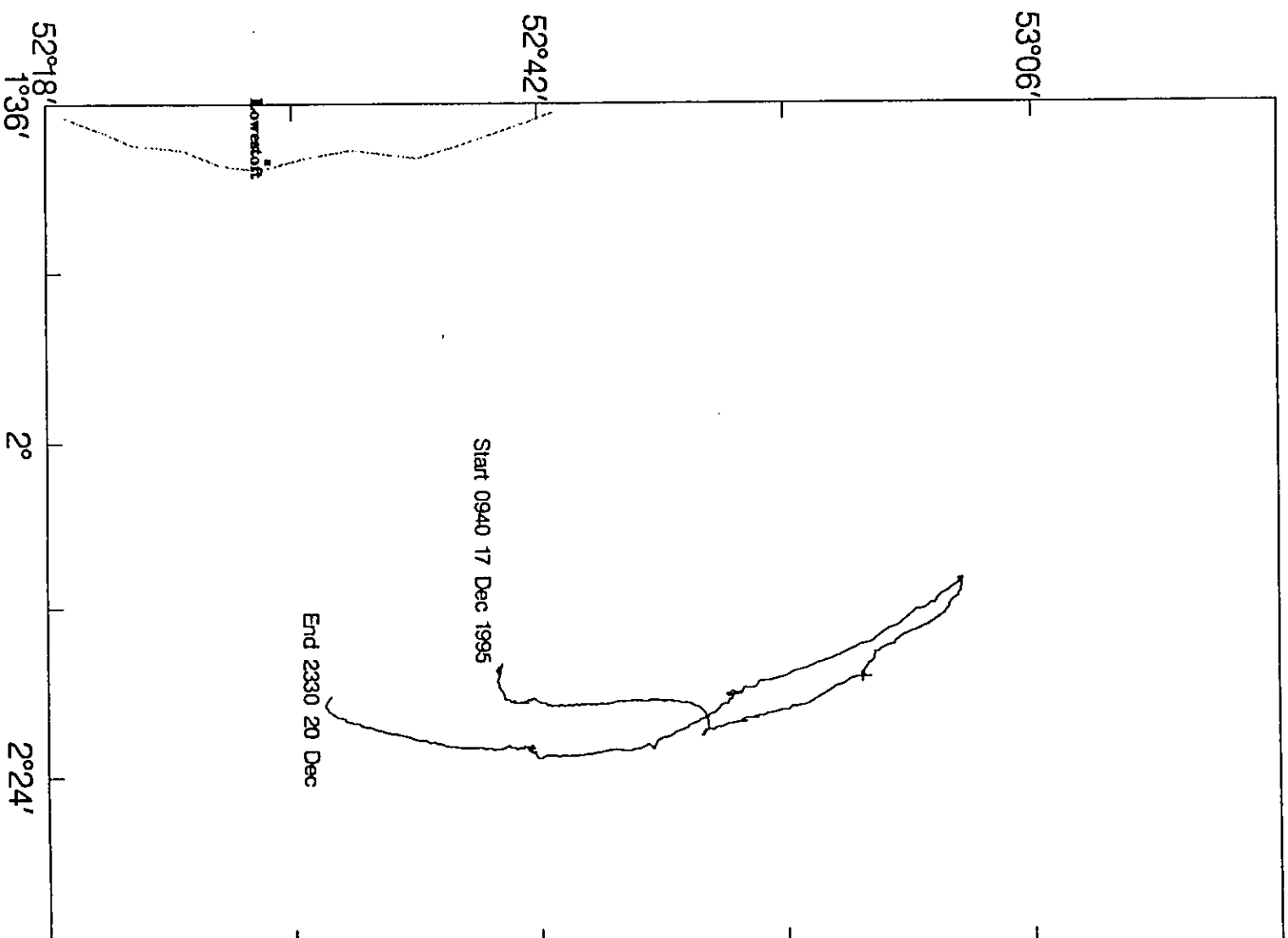


Fig. 3

Track of Fish 4, *Coarctes* 12b/95

