

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

1997 RESEARCH VESSEL PROGRAMME

REPORT: RV CORYSTES: CRUISE 2/97

STAFF: JD Metcalfe (SIC)
 BH Holford
 BF Riches
 AA Buckley
 MO Eagle
 BD Rackham
 LJVV Fernand (P/T)

DURATION: Left Lowestoft 1705 h 3 February 1997
 Docked Lowestoft 0605 h 18 February 1997

LOCALITY: Southern North Sea

AIMS:

1. To test and evaluate the synchronisation of the ADCP with the sector scanner following modification of the ADCP.
2. To estimate swimming speed and orientation of spent plaice on their post-spawning migration by simultaneous use of the sector scanning sonar and the ADCP.

NARRATIVE: (All times are Greenwich Mean Time)

CORYSTES sailed at 1705 h on 3 February and proceeded to a position about 28 km east of Lowestoft (52° 24.40'N, 02° 08.50'E) where there was a sufficient depth of water to carry out trials with the ADCP and sector scanner (Aim 1). ADCP/sector scanner trials continued until 2300 h, and CORYSTES then steamed inshore and anchored overnight in Corton Roads to shelter from south-westerly gales.

The following morning one scientist was put ashore at Lowestoft by sea-rider. CORYSTES remained at anchor for the rest of the day, sheltering from continuing south-westerly gales. The weather moderated during the evening and CORYSTES steamed overnight to a position just west of the southern end of the Brown Ridges and 8 female plaice equipped with Mk. I data storage tags were released at 0915 h on 5 February at 52° 31.18'N, 03° 14.27'E. CORYSTES subsequently steamed about 30 miles to the south-west and, after brief tag trials, fish tracking commenced at 1405 h with the release of a 41 cm spent female plaice (E66 4815), equipped with a long-life transponding acoustic tag, at 52° 15.84'N, 02° 34.46'E.

This fish, which was tracked for almost four days (94 h), remained in mid-water almost continuously for the first 26 h of the track, before going to the sea-bed at 1610 h on 6 February. The fish was abandoned at 1230h on 9 February, having made no further significant movement.

After carrying out modifications to the sector scanner's ADCP trigger circuit, a second female plaice (ripening female, 48 cm, E66 4816) equipped with a long-life transponding acoustic tag was released at 1540 h on 9 February at 52° 23.72'N, 02°

24.56'E. This fish remained in mid-water for the first 4 h of the track before going to the sea-bed but was lost 15 h later at 1030 h on 10 February in heavy sea conditions having made no further significant movements. A brief search for the fish had to be abandoned at 1200 h due to severe weather and CORYSTES steamed inshore to a position off Southwold to take shelter from south-westerly gales.

Fish tracking was suspended on 11 February due to continuing south-westerly gales. Instead, experiments to estimate tracking errors, and measurements of the tidal pressure and flow cycles, were carried out. A camera frame equipped with an acoustic tag and a pressure sensing Mk. I DST was deployed at 52° 22.14'N 01° 49.20'E and "tracked" for 13 h, during which time continuous measurements of the tidal stream speed and direction were made with the ADCP.

The weather moderated a little over night and fish tracking recommenced on 12 February. A spent adult female plaice (fish 3, 41 cm, E66 4825), also fitted with a long-life acoustic tag was released about 22 km off Lowestoft (52° 28.01'N 02° 00.60'E) at 1019 h. The fish was tracked moving north until 1730 h on 13 February when it was lost in mid-water in heavy seas off Cromer. A search continued for about 2 h but had to be abandoned due to worsening sea conditions in a north-westerly gale.

The weather moderated over night as CORYSTES returned to a position off Lowestoft. The following morning (14 February) a fourth plaice (running female, 40 cm, E69 7038), fitted with a long-life acoustic tag was, released at 52° 26.44'N 02° 01.12'E at 0931 h. This fish was tracked moving south on south-going tides until 0020 h on 15 February when tracking had to be abandoned in order to put ashore the ship's 1st Officer, who had fallen ill during the night. CORYSTES subsequently returned to the area where the fish had been abandoned but, despite an 8 h search down the projected line of movement, the fish was not relocated. Subsequently, a fifth female plaice (spent, 41 cm, E66 4819), fitted with a long-life acoustic tag was, released at 52° 12.71'N 01° 56.71'E at 1522 h. This fish was tracked for 52 h, but made no significant movements into mid-water, moving instead 2.6 km north-east along the sea-bed. The fish was eventually abandoned at 1940 h on 17 February and CORYSTES finally docked at 0605 h on 18 February.

(NB. The plaice, E69 7038, was subsequently caught in Rye Bay on 5 April)

RESULTS:

1. *Release of tagged fish.* (Additional aim) Eight plaice equipped with Mk. I data storage tags and Petersen discs were successfully released at 52° 31.18'N, 03° 14.27'E in the Southern Bight of the North Sea.
2. *Evaluation of the ADCP* (following refurbishment and synchronisation with the sector scanner). At the beginning of the cruise, and for the first fish track, the ADCP was synchronised so that interference was restricted to the near-field on the sector scanner display (<60 m range). Subsequently, a modification was made to the sector scanner's frame synchronisation circuit to adjust the timing of the ADCP trigger. This successfully removed all the interference and proved to be a marked improvement on the previous situation where significant interference from the ADCP had, on occasion, made tracking difficult.
3. *Fish tracking.* 5 adult female plaice (Fish 1 to 5) fitted with long-life acoustic tags were followed for periods of 94, 19, 31, 15 & 52 hours respectively. Fish 1 remained in mid-water almost continuously for the first 26 h of the track (Fig. 1), moving on both north-going and south-going tidal streams (Fig. 2). The fish subsequently went to the sea-bed, having travelled a net distance of 11 km. The fish remained on the sea-bed for a further 68 h without making any further substantial movements, either into mid-water or across the bottom, and was finally abandoned due to lack of movement.

Fish 2 was released in the early part of a north-going tide and remained in mid-water for almost 4 h until shortly after slack-water, when she went the sea-bed having travelled 8.5 km to the north. The fish remained on the sea-bed until the tag signal was lost 15 h later in heavy sea conditions, having made no further significant movements.

Fish 3 moved in to mid-water on three consecutive north-going tides (Fig.3), and moved 43.5 km north (Fig. 4) by selective tidal stream transport before being lost in mid-water in heavy sea conditions.

Fish 4 moved 21 km south by selective tidal stream transport on two consecutive tides, but had to be abandoned whilst still in mid-water.

Fish 5 moved only 2.6 km north-east along the sea-bed and made no significant excursions into mid-water.

The long-life tags worked extremely well giving clear signals out to over 350 m. Measurements of the speed and direction of the tidal streams were made with the ADCP continuously during the tracks of the fish and valuable data for calculating swimming speed and orientation of the fish were gathered during mid-water excursions.

Throughout tracking, the "Sextant" survey package was used continuously and to very good effect to display the position of the fish relative to the ship.

JD Metcalfe
17 February 1997

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

INITIALLED: G P A

DISTRIBUTION:

Basic list +
JD Metcalfe
BH Holford
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AA Buckley
MO Eagle
BD Rackham
LJVV Fernand
Clerk, Eastern Sea Fisheries Committee
Foreign and Commonwealth Office

FIGURE CAPTIONS:

Figure 1. The vertical track (7 point running mean with bottom contact preserved) of fish 1 (41 cm, Petersen tag no.E66 4815),(fish: — ; sea bed: ----).

Figure 2. The ground track of fish, 1405 h, 5 February - 1230 h, 9 February.

Figure 3. The vertical track (7 point running mean with bottom contact preserved) of fish 3 (41 cm, Petersen tag no.E66 4825),(fish: — ; sea bed: ----).

Figure 4. The ground track of fish, 1019 h, 12 February - 1730 h, 13 February.

Vertical track of fish 1
Corystes 2/97

Fig. 1

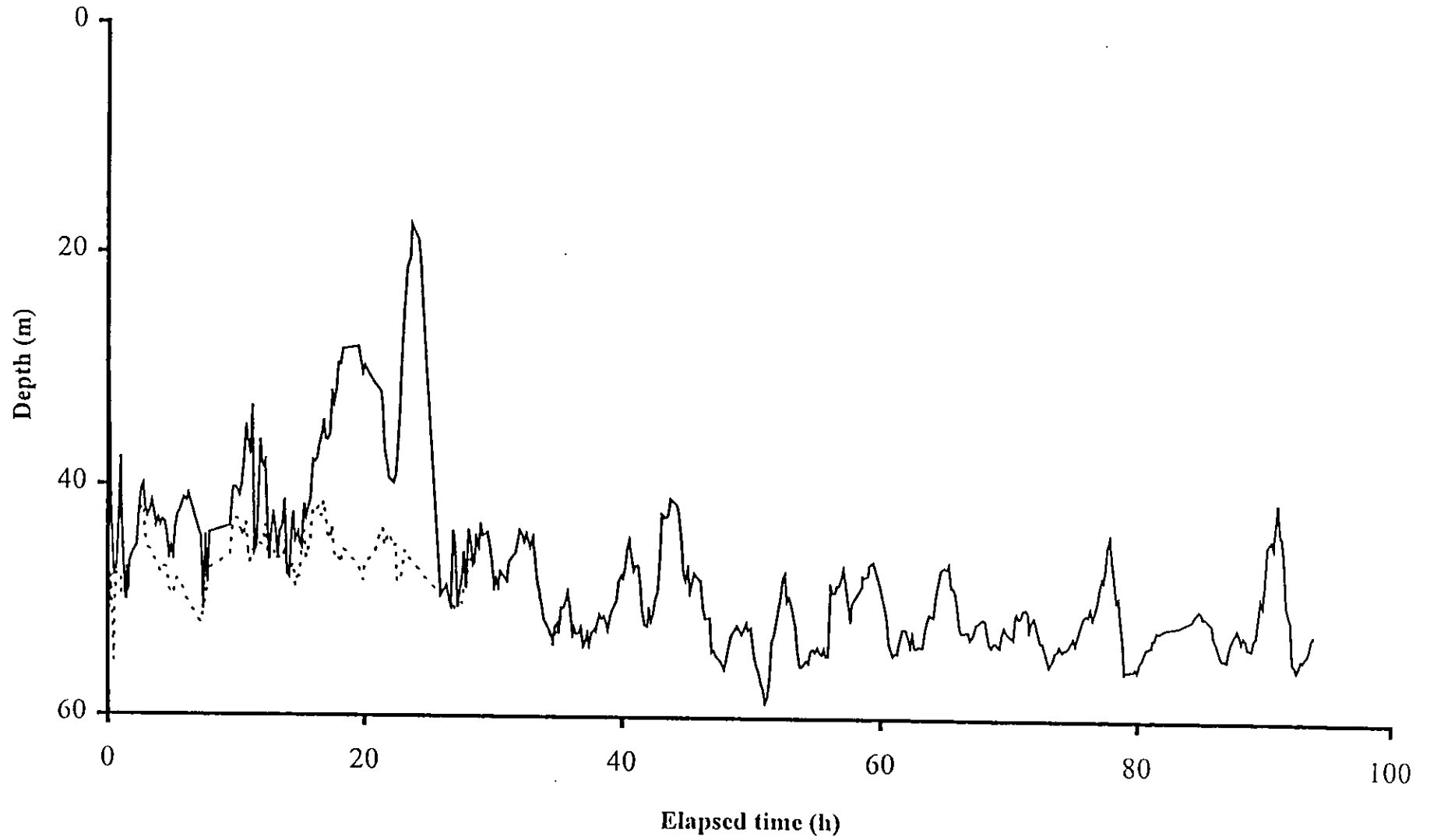
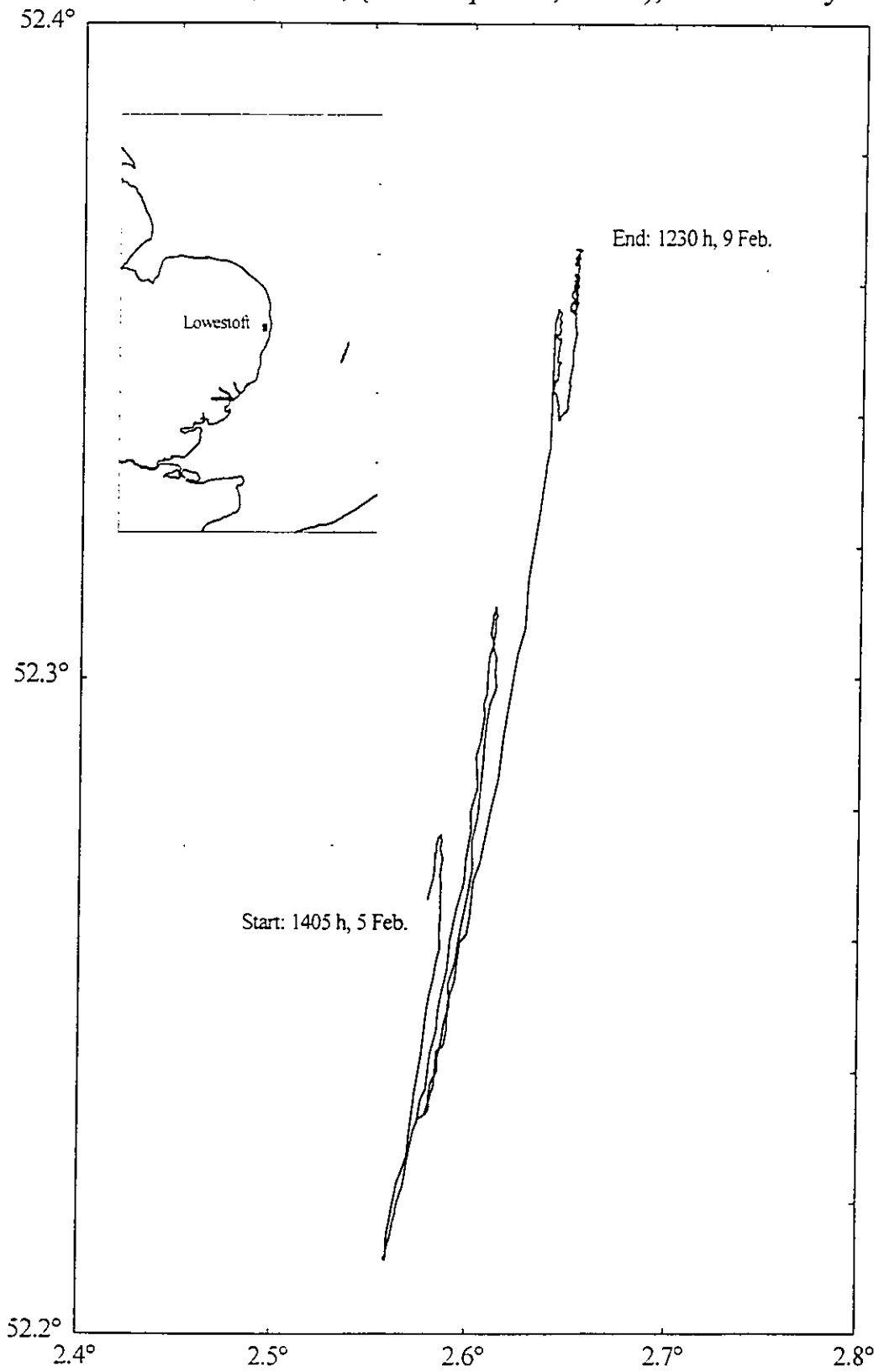


Fig. 2

Ground track, fish 1, (female plaice, 41cm), 5-9 February 1997.



Vertical track of Fish 3
Corystes 2/97

Fig. 3

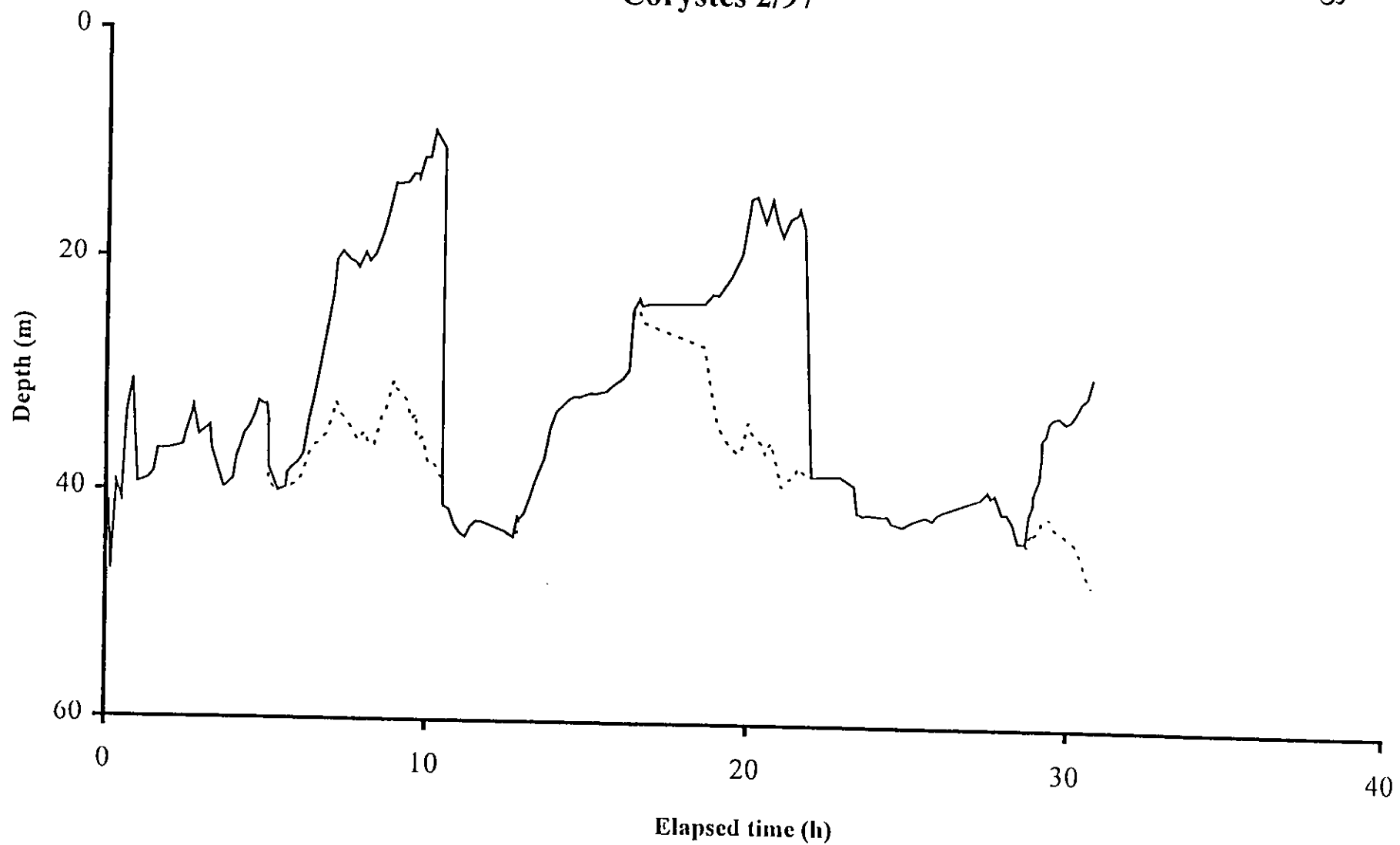


Fig. 4

Ground track, fish 3, (female plaice, 41cm), 12-13 February 1997.

