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

1993 RESEARCH VESSEL PROGRAMME

REPORT: RV CORYSTES: CRUISE 1B

STAFF: J D Metcalfe (SIC)
G P Arnold
B H Holford
B F Riches
A A Buckley
M O Eagle

DURATION: Left Lowestoft 1620 h 18 January 1993
Docked Lowestoft 11420 h 27 January 1993
(all times GMT)

LOCALITY: Southern North Sea

AIMS:

1. To deploy 100 adult plaice fitted either with dummy data storage tags (DST) or conventional Petersen tags.

   (NB. the original aim to deploy plaice fitted with electronic data storage tags had to be postponed due to delays in manufacture).

2. To track migrating adult plaice with long-life transponding acoustic tags and simultaneously measure speeds and directions of tidal streams with an acoustic Doppler current profiler (ADCP).

NARRATIVE:

CORYSTES sailed on the evening tide of 18 January and proceeded to position 52°00.02'N 02°19.98'E to deploy the first batch (26) of tagged plaice. Similar numbers were released at three further stations (52°09.99'N 02°30.01'E; 52°19.98'N 02°19.95'E; and 52°29.95'N 02°30.18'E). Deployment of tagged fish was complete by 0100 h and CORYSTES dodged off Sizewell over night to shelter from SW gales.

During the morning of 19 January, the switch-mode and 2 large 300 kHz acoustic transponding tags were demonstrated successfully. Fish tracking commenced at 1328 h. A maturing adult female plaice (fish 1) fitted with a long-life acoustic tag (TX2) was released at 52°11.10'N 01°41.78'E. Tracking was carried out inshore to shelter from forecast SW gales. The fish was successfully tracked for over 65 h, through marginal weather conditions, but was eventually lost at 0700 h on 22 January at 52°41.68'N 02°05.69'E. A search for the fish was

abandoned at 1350 h on the same day. CORYSTES then returned to shelter off Sizewell to recommence tracking the next day.

A second female plaice (fish 2), fitted with a pressure-sensing acoustic transponding tag (PT13R), was released at 0936 h on 23 January at 52°09.67'N 01°39.83'E during a lull in the weather. Again the fish was tracked inshore to shelter from forecast SW gales. The fish was tracked through worsening weather conditions, during which several electronic problems developed with the sector scanner (spontaneous range switching and repeated problems with the synchro-to-digital converters) making tracking extremely difficult and causing the signal to be lost temporarily on several occasions. These problems appeared to be, in part at least, attributable to the motion of the ship in the severe weather conditions. The fish was finally abandoned at 2256 h on the same day due to the severe weather. CORYSTES sheltered off Southwold overnight and for all of the following day.

During the morning of 25 January further trials with a 300 kHz tag with an extended pulse length (11 ms) were carried out. During these trials a deterioration in transmission from the sector scanner was noticed and inspection revealed damage to the transmitter cable. A temporary but effective repair was made and, with improving weather conditions, fish tracking was recommenced at 1758 h. A gravid adult female plaice (fish 3), fitted with a long-life acoustic tag (TX4), was released inshore (52°10.01'N 01°39.87'E) and tracked until 0930 h on 27 January.

RESULTS:

1. *Dummy tag release*

A total of 51 dummy DST tagged fish and 51 conventionally tagged fish were released at 4 stations about 12 miles apart to test the return of DSTs through the commercial fishery. The dummy tags had been made to be the same weight, size and shape as the electronic DST.

2. *Fish tracking*

Two adult female plaice fitted with long-life acoustic tags (fish 1 and 3), and one fitted with a pressure-sensing acoustic tag (fish 2), were followed for periods of 65, 13 and 39 hours respectively. Measurements of the speed and direction of the tidal stream were made with the ADCP for long periods during the midwater excursions of the track of plaice 1 and 3 (Figures 1 and 3) and for more limited periods when these fish were on the sea bed. Acoustic interference on the sonar made tracking difficult at all times, particularly on the bridge repeater display, and the ADCP had to be switched off occasionally to avoid losing the fish.

3. *Acoustic tag and scanner performance*

The pressure-sensing tag worked well during the limited track of plaice 2 giving clear signals out to 250 m and occasionally beyond. The line scan recorder (required to give a continuous record of the telemetry signal) failed to receive signals from the sonar after about 2 h of operation and all pressure readings were therefore only recorded at 5 min intervals on the sector scanner.

The switch-mode tag was successfully triggered from the ship to switch between pulse lengths of 3 ms and 6 ms. The longer pulse length improved signal quality noticeably at long range and trials were recorded on U-matic video.

The long-life tag worked extremely well giving clear signals out to over 300 m aiding tracking in marginal weather conditions.

J D Metcalfe
27 January 1993

SEEN IN DRAFT: M J Willcock (Master)
M J Reeder (Senior Fishing Mate)

INITIALLED:

DISTRIBUTION:

Basic list +
J D Metcalfe
G P Arnold
B H Holford
B F Riches
A A Buckley
M O Eagle
Clerk, Eastern Sea Fisheries Committee

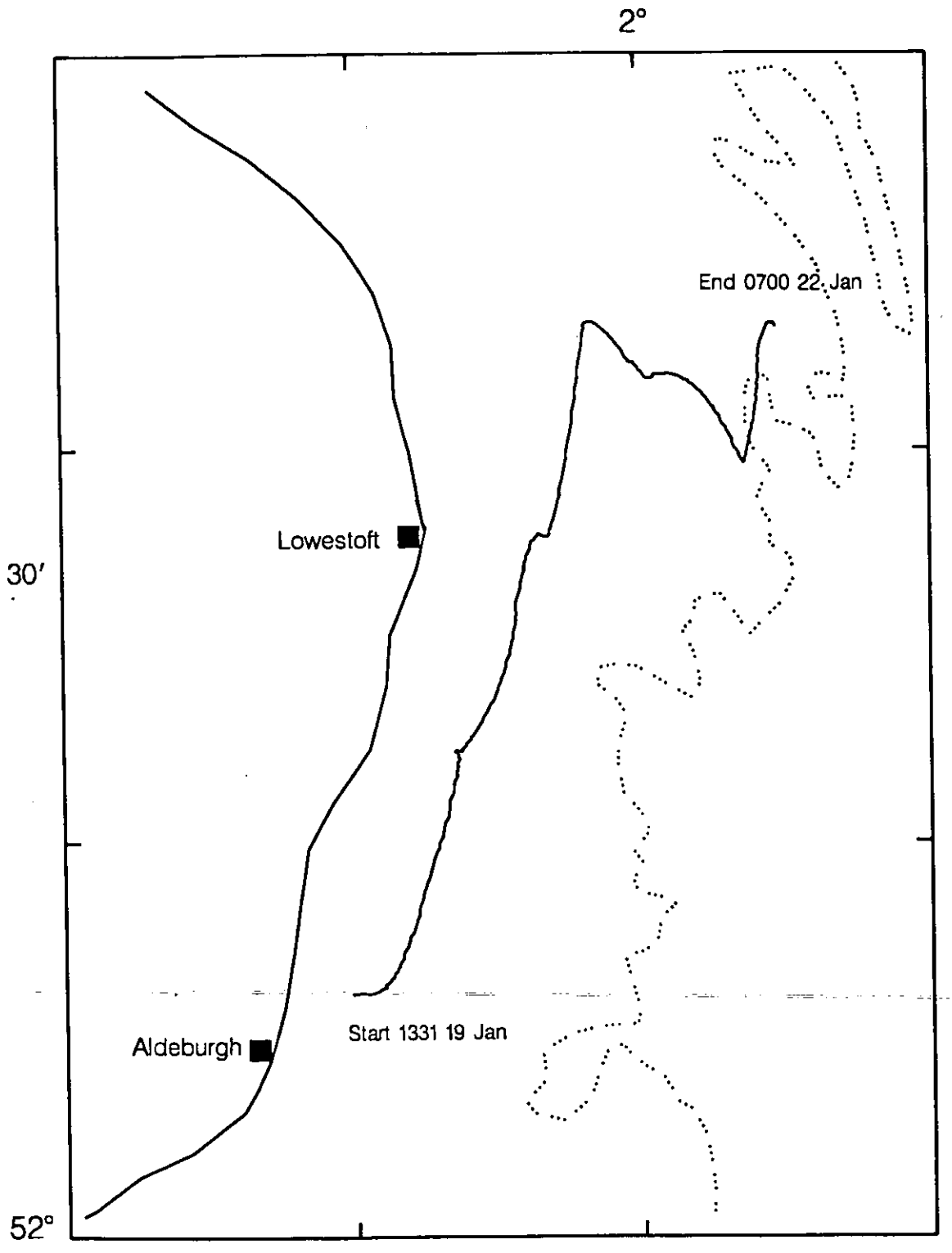
FIGURE CAPTIONS:

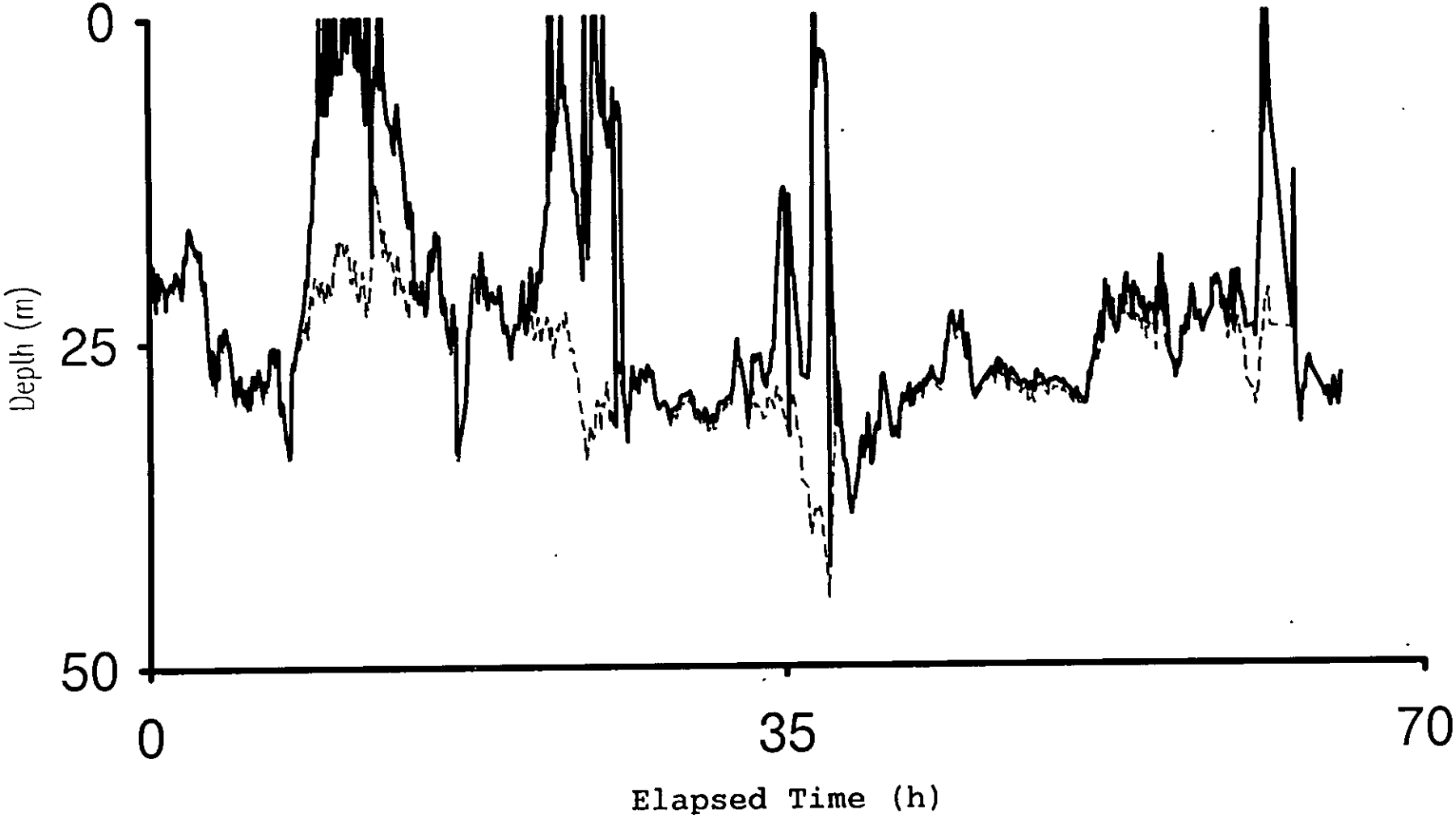
Figure 1. The ground track of plaice 1 (45 cm, Petersen tag No. E66 1830) which moved 61 km north-north-east by selective tidal stream transport on three consecutive north-going tides (Figure 2). The fish then swam south-east close to the sea bed, assisted by a south-going tide, for 18 km, and was finally transported north in midwater for 12 km on a north-going tide (30 m contour: ··· ··· ···).

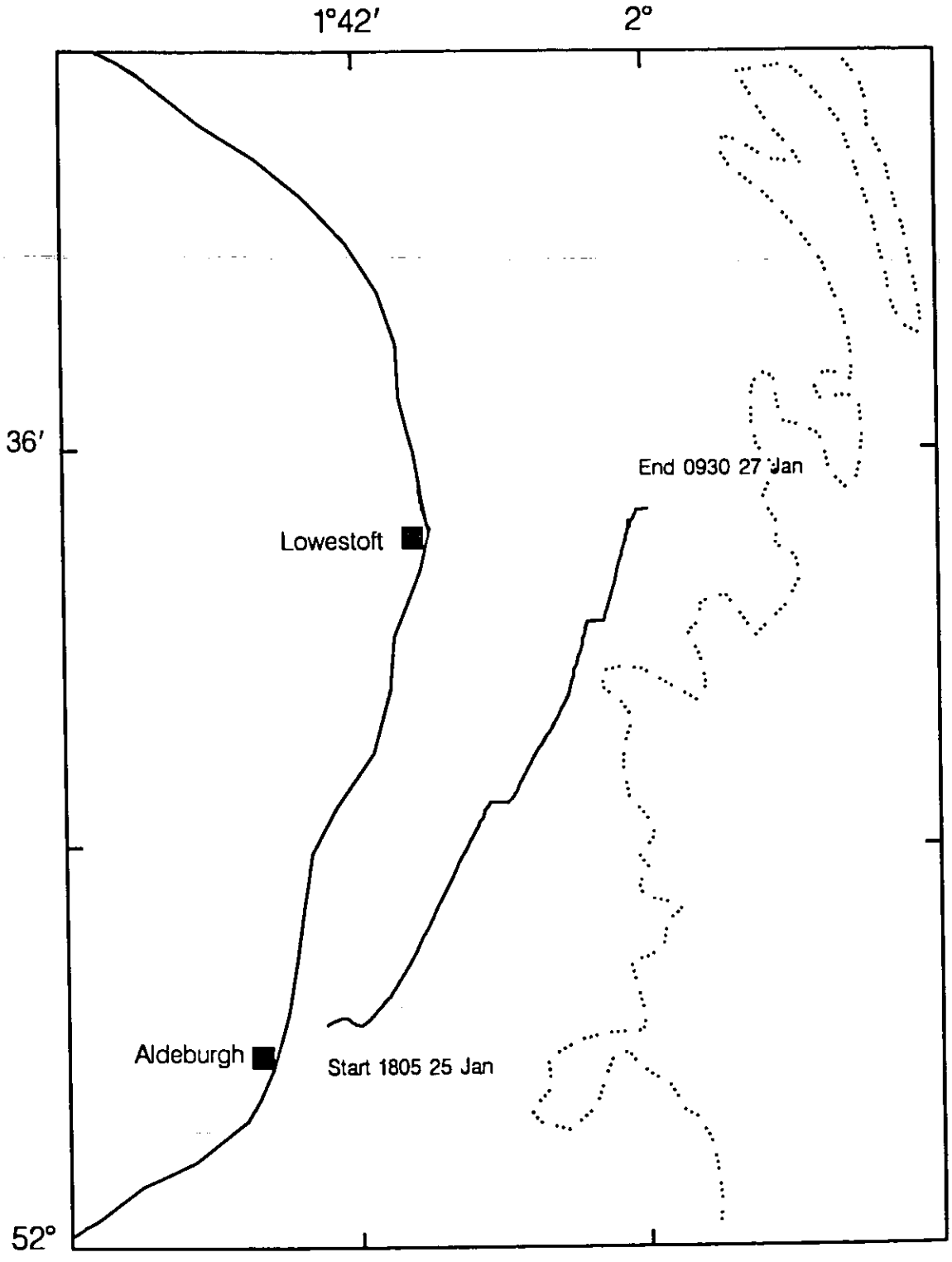
Figure 2. The vertical track of plaice 1 (fish: _____, sea bed: - - - -).

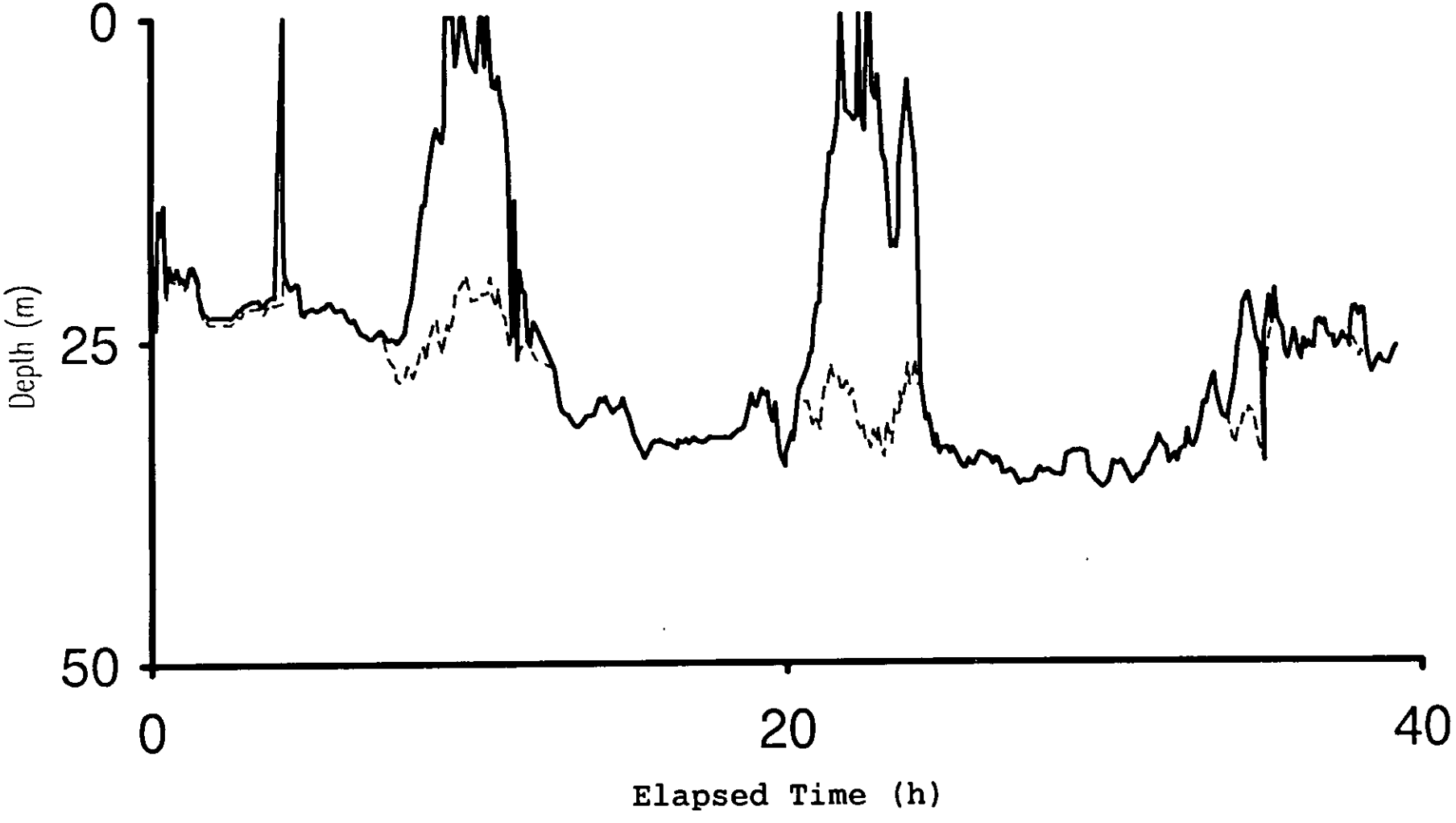
Figure 3. The ground track of plaice 3 (47 cm, Petersen tag No. E66 1821) which moved 51 km north-north-east by selective tidal stream transport on two consecutive north-going tides (Figure 4) (30 m contour: ··· ··· ···).

Figure 4. The vertical track of plaice 3 (fish: _____, sea bed: - - - -).


2°
End 0700 22 Jan
Lowestoft
30′
Aldeburgh
Start 1331 19 Jan
52°


0
25
50
Depth (m)
0
35
70
Elapsed Time (h)


1°42′
2°
36′
52°
Lowestoft
Aldeburgh
End 0930 27 Jan
Start 1805 25 Jan


0
25
50
Depth (m)
0
20
40
Elapsed Time (h)