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MRV *Alba na Mara*

Survey 2018A

PROGRAMME

6-19 December 2018

Loading: Leith, 03 December 2018

Unloading: Fraserburgh, 19 December 2018

In setting the survey programme and specific objectives, etc the Scientist-in-Charge needs to be aware of the restrictions on working hours and the need to build in adequate rest days and rest breaks as set out in Marine Scotland's Working Time Policy (Lab Notice 34/03). In addition, the Scientist-in-Charge must formally review the risk assessments for the survey with staff on-board before work is commenced.

In the interest of efficient data management, it is now mandatory to return the Survey Report, to I Gibb and the Survey Summary Report (old ROSCOP form) to M Geldart, within four weeks of a cruise ending. In the case of the Survey Summary Report a nil return is required, if appropriate.

Out-turn days per project: 20508 - 14 days

Equipment

Sandeel dredge x 2 (modified 4' scallop dredge with 6" teeth and spare toothbars) with towing bar and camera attachment.

TV camera.

Minilogger (or equivalent – i.e. DST).

Objectives

1. To determine the abundance, length and age of sandeels in the sediment from regions east of the Firth of Forth and around Turbot bank.
2. To collect and preserve samples of *A. marinus*, specifically:
 - a. all 0-group sandeels (size to be estimated from age/length keys of sampled catches) not required for age determination;
 - b. 100 age-1 individuals from each of the northerly and southerly sub-regions.
3. To determine the sex and maturity stage of all sandeels selected for ageing.

Procedure

All required gear will be loaded onto the vessel on 3 December. Scientific staff will join the vessel in Leith on 6 December.

After all required drills have been undertaken, and once sailed from Leith port, the vessel will, after consultation with the master, head to the most suitable sampling location to start the survey.

Two regions of historical importance for sandeel fishing will be surveyed (see Figure 1). In the first half of the survey a series of eight dredge stations to the east of the Firth of Forth will be sampled following the protocol established in 1999. A modified scallop dredge will be used to catch sandeels buried in the substrate at the priority stations given in Table 1 and Figure 2. Further stations in this region will be sampled if time permits. In the second half of the survey, the dredge will be deployed at stations 20-36 in the Turbot bank region (Table 1, Figure 2). Ideally five repeat tows will be conducted at each station although this may be reduced to a minimum of two if catch quantities are low or available time is limited. Dredge duration will be approximately ten minutes at a towing speed between two and three (ideally 2.5) knots.

At each dredge station, all sandeels will be identified to species level, measured, and otoliths (5, 8 or 10 depending on length strata, per half centimetre) will be taken for age determination (Objective 1).

All 0-group sandeels will be retained and frozen individually for later analysis. Sub-samples of 100 age-1 (size to be determined from age-length keys of sampled catches) *A. marinus* will be taken from the northerly (latitude > 57°N) and southerly (latitude < 57°N) sub-regions (Objective 2).

Sandeels selected for ageing will be hand stripped and assigned a maturity stage based on a simple three-point scale (I = immature/indeterminate sex; MM= mature male; MF = mature female). Immature individuals will be individually frozen for further dissection and assigned to one of two stages (IM =Immature male or IF= Immature Female). (Objective 3).

Following the completion of survey work, *Alba na Mara* will return to Fraserburgh for unloading.

Normal contacts will be maintained with the laboratory.

Submitted:
T Regnier
13 November 2018

Approved:
I Gibb
27 November 2018

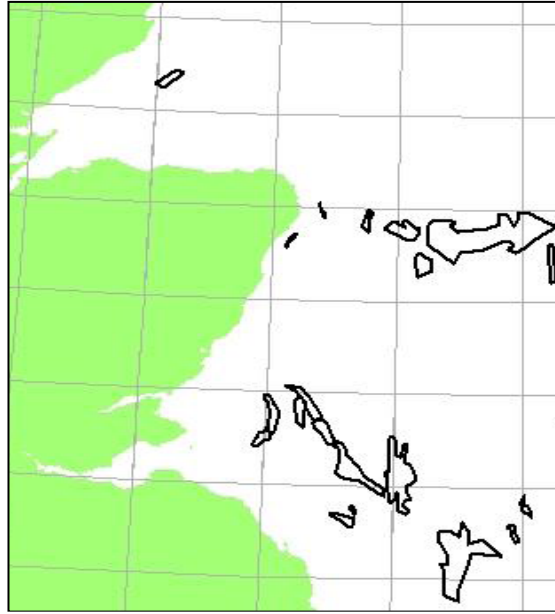


Figure 1: Location of important sandeel fishing areas.

| Station | Latitude | Longitude | Depth (m) |
|---------|--------------|--------------|-----------|
| 1 | 56°05.880' N | 01°20.460' W | 46 |
| 2 | 56°07.380' N | 01°23.280' W | 51 |
| 3 | 56°13.560' N | 02°03.240' W | 37 |
| 4 | 56°14.580' N | 02°02.340' W | 41 |
| 7 | 56°24.840' N | 02°25.980' W | 29 |
| 8 | 56°25.080' N | 01°58.800' W | 44 |
| 9 | 56°28.020' N | 01°43.920' W | 49 |
| 10 | 56°21.840' N | 01°41.760' W | 42 |
| 12 | 56°14.940' N | 01°58.620' W | 44 |
| 17 | 56°03.900' N | 01°19.620' W | 45 |
| 18 | 55°47.700' N | 01°19.680' W | 54 |
| 19 | 56°39.960' N | 01°48.300' W | 60 |
| 20 | 57°19.200' N | 01°06.420' W | 82 |
| 21 | 57°42.780' N | 01°13.080' W | 78 |
| 22 | 57°44.400' N | 01°25.620' W | 97 |
| 23 | 57°46.500' N | 01°28.980' W | 83 |
| 24 | 57°23.940' N | 00°42.300' W | 70 |
| 26 | 57°23.460' N | 01°47.340' W | 44 |
| 27 | 57°42.720' N | 01°35.400' W | 88 |
| 28 | 57°41.100' N | 01°35.040' W | 97 |
| 29 | 57°43.200' N | 02°12.960' W | 49 |
| 30 | 57°22.140' N | 00°41.580' W | 67 |
| 31 | 57°24.300' N | 00°48.600' W | 73 |
| 32 | 57°22.080' N | 00°50.280' W | 71 |
| 33 | 57°21.900' N | 00°57.060' W | 66 |
| 34 | 57°25.020' N | 00°53.340' W | 76 |
| 35 | 57°25.560' N | 01°06.960' W | 71 |
| 36 | 57°24.000' N | 01°02.520' W | 65 |

Table 1: Location of dredge stations. Priority stations (1 – 10; 24,30,32-34 and 36) are highlighted.

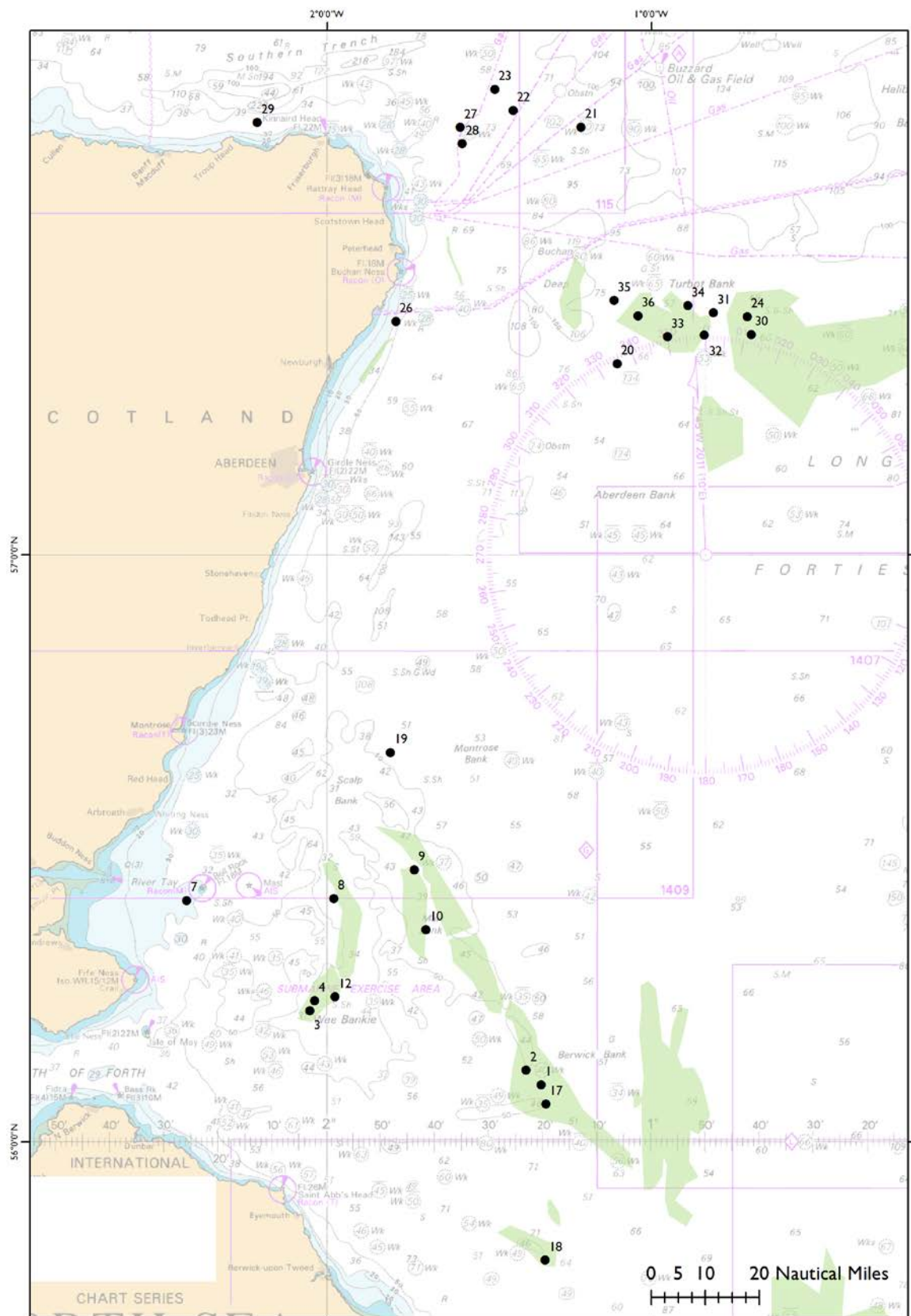


Figure 2: Chart of dredge stations to be sampled in 2018A. Areas historically fished for sandeel are shown in green.