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MRV *Alba na Mara*

Survey 1821A

PROGRAMME

6-21 December 2021

Loading: Leith, 03 December 2021

Unloading: Fraserburgh, 21 December 2021

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: 20670 - 16 days

Equipment

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

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*, from the different stations for further analyses and partners at UK-CEH.
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 3rd December, and scientists will be join the vessel on 5/6. December. Two regions of historical importance for sandeel fishing will be surveyed (see Figure 1) in the period 6 December - 21 December, weather permitting. In addition, new stations outside the closed area (stations 53-63) will be sampled to investigate the effect of fishing pressure on size and length distributions. 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. 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 and some fish bycatch will be retained and frozen for later analysis. Sub-samples of 100 age-1 sandeel (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).

All operations on board will be performed in compliance with the required regulations and guidance associated with the covid-19 pandemic.

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
22 November 2021

Approved:
I Gibb
02 December 2021

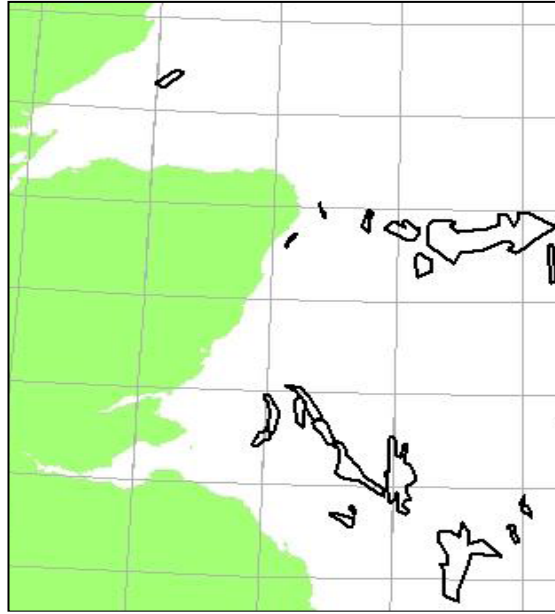


Figure 1: Location of important sandeel fishing areas.

Station	Lat	Lon	Bank/Area	Region
1	56°5.94'N	1°20.58'W	Berwick Bank	<i>FOF</i>
2	56°7.32'N	1°23.28'W	Berwick Bank	<i>FOF</i>
3	56°13.5'N	2°3.36'W	Wee Bankie	<i>FOF</i>
4	56°14.64'N	2°2.34'W	Wee Bankie	<i>FOF</i>
7	56°25.02'N	2°26.1'W	Bell Rock	<i>FOF</i>
8	56°24.96'N	1°58.62'W	NW Marr Bank	<i>FOF</i>
9	56°28.1'N	1°44.1'W	N Marr Bank	<i>FOF</i>
10	56°21.9'N	1°41.9'W	Marr Bank	<i>FOF</i>
12	56°14.76'N	1°58.92'W	Wee Bankie	<i>FOF</i>
17	56°3.9'N	1°19.7'W	Berwick Bank	<i>FOF</i>
18	55°47.6'N	1°19.4'W	South Berwick Bank	<i>FOF</i>
19	56°39.9'N	1°48.3'W	Scalp Bank	<i>FOF</i>
20	57°19.1'N	1°6.6'W	Turbot Bank West	<i>TUR</i>
21	57°42.7'N	1°13.1'W	Aeroplane Bank	<i>TUR</i>
22	57°44.4'N	1°26'W	Belgar Head	<i>TUR</i>
23	57°46.4'N	1°28.9'W	Belgar Head	<i>TUR</i>
24	57°24.1'N	0°42.1'W	Turbot Bank Central	<i>TUR</i>
26	57°23.22'N	1°47.34'W	Cruden Bay	<i>TUR</i>
27	57°42.8'N	1°35.7'W	Ratray Head	<i>TUR</i>
28	57°41.3'N	1°35'W	Ratray Head	<i>TUR</i>
29	57°43.2'N	2°12.7'W	Aberdour Bay	<i>TUR</i>
30	57°22.2'N	0°41.5'W	Turbot Bank Central	<i>TUR</i>
31	57°24.1'N	0°48.7'W	Turbot Bank Central	<i>TUR</i>
32	57°22.1'N	0°50.3'W	Turbot Bank Central	<i>TUR</i>
33	57°21.96'N	0°57.06'W	Turbot Bank West	<i>TUR</i>
34	57°24.9'N	0°52.9'W	Turbot Bank Central	<i>TUR</i>
35	57°25.5'N	1°6.9'W	Turbot Bank West	<i>TUR</i>
36	57°24'N	1°2.4'W	Turbot Bank West	<i>TUR</i>
52	57°43.38'N	1°58.56'W	Fraserburgh	<i>TUR</i>
53	56°7.885'N	0°57.637'W	Stendysen v. Aberdeen	<i>FOF</i>
54	56°4.571'N	0°56.911'W	Stendysen v. Aberdeen	<i>FOF</i>
55	56°2.948'N	0°52.502'W	Stendysen v. Aberdeen	<i>FOF</i>
56	55°39.122'N	0°33.695'W	Eventyr Bank	<i>FOF</i>
57	55°34.551'N	0°31.713'W	Eventyr Bank	<i>FOF</i>
58	55°31.724'N	0°31.745'W	Eventyr Bank	<i>FOF</i>
59	57°13.661'N	0°48.875'W	Aberdeen Bank	<i>TUR</i>
60	57°10.704'N	0°46.984'W	Aberdeen Bank	<i>TUR</i>
61	57°25.758'N	0°1.216'W	Turbot Bank East	<i>TUR</i>
62	57°23.075'N	0°0.945'W	Turbot Bank East	<i>TUR</i>
63	57°19.247'N	0°1.278'W	Turbot Bank East	<i>TUR</i>
101	57°45.9'N	2°54.3'W	Buckie	<i>TUR</i>

Table 1: Location of dredge stations.

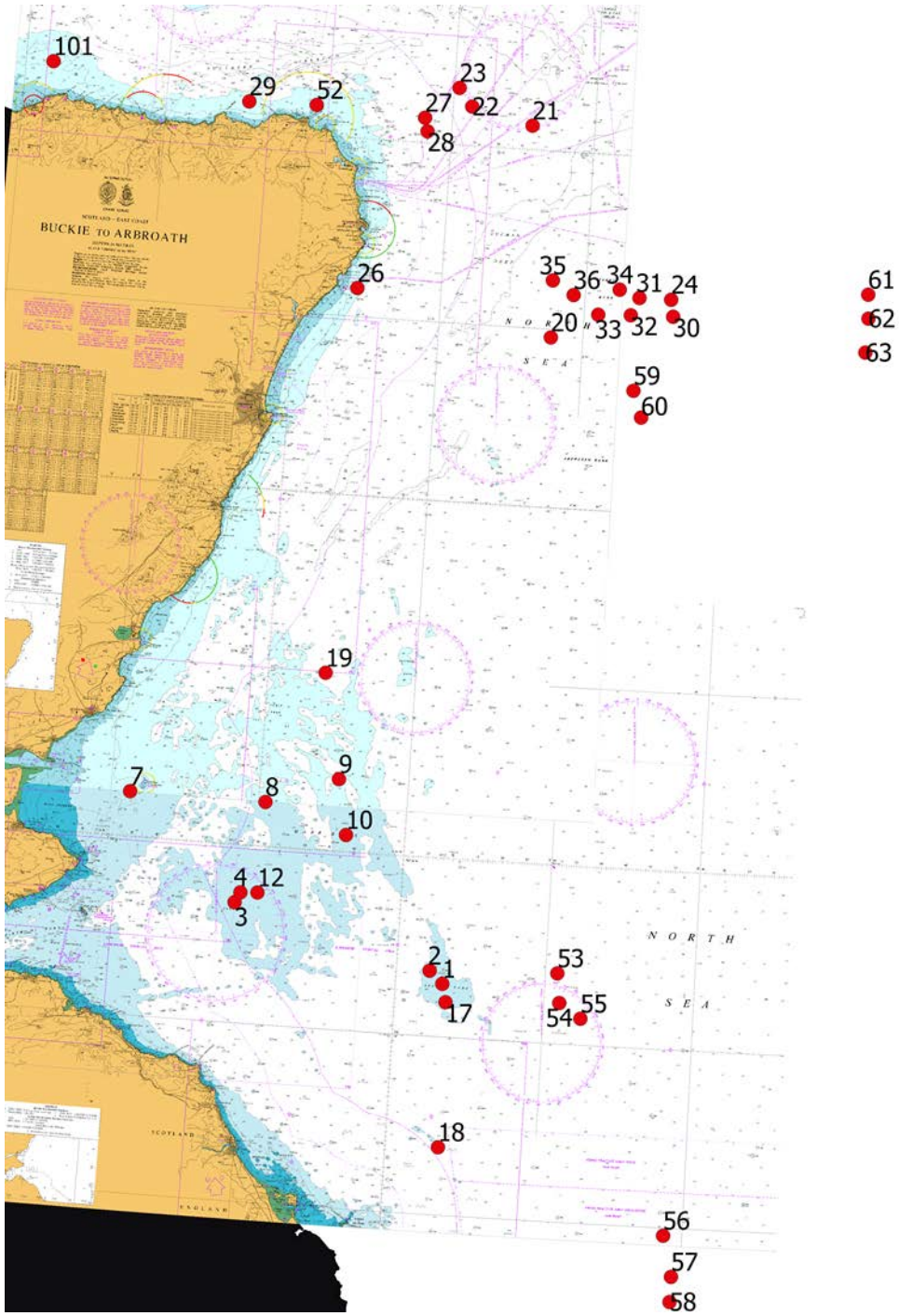


Figure 2: Chart of dredge stations to be sampled in 1821A.