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MRV *Alba na Mara*

Survey 1121A

PROGRAMME

23 August - 7 September, 2021

Loading: Troon, 18 August

Unloading: Troon, 07 September

Half Landing: Troon, 28 August

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 survey ending. In the case of the Survey Summary Report a nil return is required, if appropriate.

Project: 16 days; Project Code 20565. C44700

Sampling Gear & Equipment

- 1 x Seacam HD video camera (MSS to supply)
- 1 x Digital Stills camera - Kongsberg OE14-408 (Seatronics hire by SNH)
- 1 x Table drop frame (Seatronics hire by NS)
- 4 x LED lights and cables (Seatronics hire by SNH)
- 2 x Line lasers + cables (MSS to supply)
- 1 x Armoured TV umbilical cable (MSS to supply) + spare

Overview

Survey 1121A serves work carried out by NatureScot investigating the distribution and condition of benthic habitats around Scotland. Data are required to underpin the management of marine protected areas and priority marine features, to meet commitments prescribed by the Scottish MPA Monitoring Strategy, and to improve coverage required for the PMF review consultation.

Objectives

1. To establish the current status of benthic habitat protected features in areas: 1. South Arran MPA and 2. Clyde Sea Sill MPA, using video survey techniques.

Sufficient areas have been identified to enable work to be carried out under a variety of weather conditions. Sampling intensity in the identified areas can be adjusted depending on conditions and speed of completion of sampling.

Embarkation

Scientists will join the vessel on the evening of 22 and morning of 23 of August in Troon. Weather permitting *Alba na Mara* will head to the first study site off the island of Arran at her earliest convenience.

Benthic survey

The survey will target the following areas:

Arran (Figure 1)

1. Video transects in mud boxes (T1 to T4) – estimate two days
2. Video transects in maerl boxes (D1 to D5) – estimate two days
3. Video across the new flame shell bed off Pladda – estimate two hours
4. Repeat of the lander quadrat stills imagery – estimate seven days (as in 2016)

Clyde and Clyde Sea Sill (Figure 2)

5. Gap filling and Clyde Sea Sill video stations – estimate three days

Detailed geospatial layers of all boxes and gap filling station details will be provided before the survey, as well as a 'survey summary spreadsheet'.

Operations

The Alba 1121A survey will utilise the HD drop camera system deployed from the aft of the vessel. This system will be fitted with two line lasers to allow species densities to be estimated. Species type, density and substrate type (assessed visually) will be classified for each video transect post-survey.

Daily scientific sampling will occur between 0700 and 1900 hrs (all times BST). Opportunities for the vessel to top up on freshwater will be taken opportunistically. However, *Alba na Mara* may be required to dock overnight at a suitable locality for this purpose. Scientific operations will cease on the 06 September to allow sufficient time for the vessel to travel to Troon. Unloading will occur in Troon on the morning of the 07 September.

Normal contact will be maintained with the Laboratory.

Specific Survey Instructions:

The survey will collect drop video and stills imagery using the following procedures:

General video recording procedure

1. Record and save both SD video with overlay and HD video.
2. Record a clapperboard with station name, date and survey name at the start of every video, then pause recording until camera frame is at the seabed (both on HD and SD; if necessary clips can be split into clapperboard and the actual video separately)
3. Start recording SD and HD when camera frame is at the seabed. Record station name, date, time, position, water depth (preferably by populating the "survey summary spreadsheet" supplied)
4. Record video for the required length of time. Make a note of general habitat or PMFs you happen to see (e.g. mud, maerl bed, mixed sediments, bedrock, vertical cliff with northern sea fans, etc)

5. Where habitat allows land the frame to take a stationary still photograph roughly every minute. If landing not possible try taking still images while moving.
Record image file name, station name, date, time, position, depth for each image if possible.
If not possible then just group images by video tow station.

Arran survey boxes additional notes

1. Complete between 1 hour and 2 hours of video per box.
2. Take a still image approximately every minute (stationary/landed where possible) – adjust timing of image to make it most likely to be in focus rather than hitting the one minute interval mark precisely.
3. Spread video tows relatively evenly across the box.
4. Ensure relatively even coverage inside and outside management zone in boxes which straddle the boundary (T1, T2, T3, T4).
5. It does not matter whether tows run N-S or E-W or any other direction.
6. Keep tows approximately on the target habitat: mud for boxes T1-T4, maerl or maerl gravel for boxes D1-D5. This is especially relevant for D1 and D3 which slope off into deeper habitats along the edges (i.e. end tows where they slope off rather than continuing the boundary of the box. In D3 try to keep tows to 20m or less).
7. FS box: approximately five parallel tows, high resolution coverage of box – looking to identify margins of flame shell bed.

Gap filling and Clyde and Clyde Sea Sill additional notes

8. Record five minutes of video per station. If particularly interesting habitats are encountered it can be worth doing more than five minutes to try and find the boundary of the habitat (e.g. maerl beds, horse mussel beds etc.).
9. End recording 2-3 seconds after frame leaves seabed (this adds valuable context to the close-up footage).

Prioritisation principles

1. Survey boxes around Arran are first priority.
 - a. Mud boxes are higher priority than maerl boxes.
 - b. Flame shell box is higher priority than maerl boxes too.
 - c. Of the maerl boxes, D4 is highest priority (hardest to access from smaller boat.)
 - d. Prioritise completing boxes over doing a bit of work in each (so if pushed for time, miss out entire boxes).
2. Repeat of still image quadrates is second priority
3. Gap filling and Clyde Sea Sill is third priority. No further prioritisation between these.

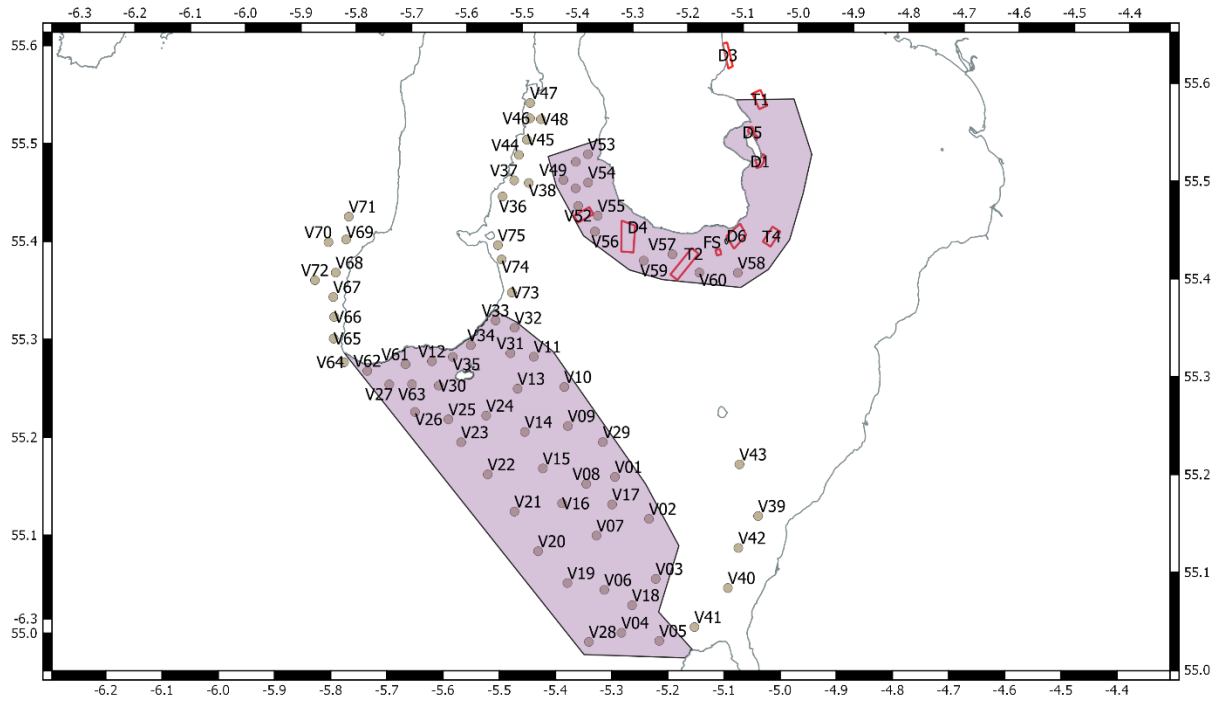
Metadata and data storage

1. Please record details of cameras used on the metadata tab of the survey summary spreadsheet, and fill in the survey summary spreadsheet to record each video station.
2. Station name format should be 'Box name' followed by 'V'[1,2,3 etc], so D2V1, D2V2 etc. Gap filling stations can simply be V[1-n] counting up.
3. Please save HD and SD video into one folder each, and still images in separate folders per day or station/box.
If video files can be re-named that makes storage easier but appreciate you may not have time for that. Naming convention is SurveyName_Station_date.xxx e.g. Arran2021_D4V1_2021_08_03_clapper.m2ts, followed by Arran2021_D4V1_2021_08_03.m2ts (the actual video).
4. Please supply a ship log/track file with date, time, position, depth for the survey period.

5. If possible the shape file of station tracks which you usually create would be very useful to have too.

Submitted: P Boulcott, 17 August 2021
Approved: I. Gibb, 20 August 2021

Overview Map



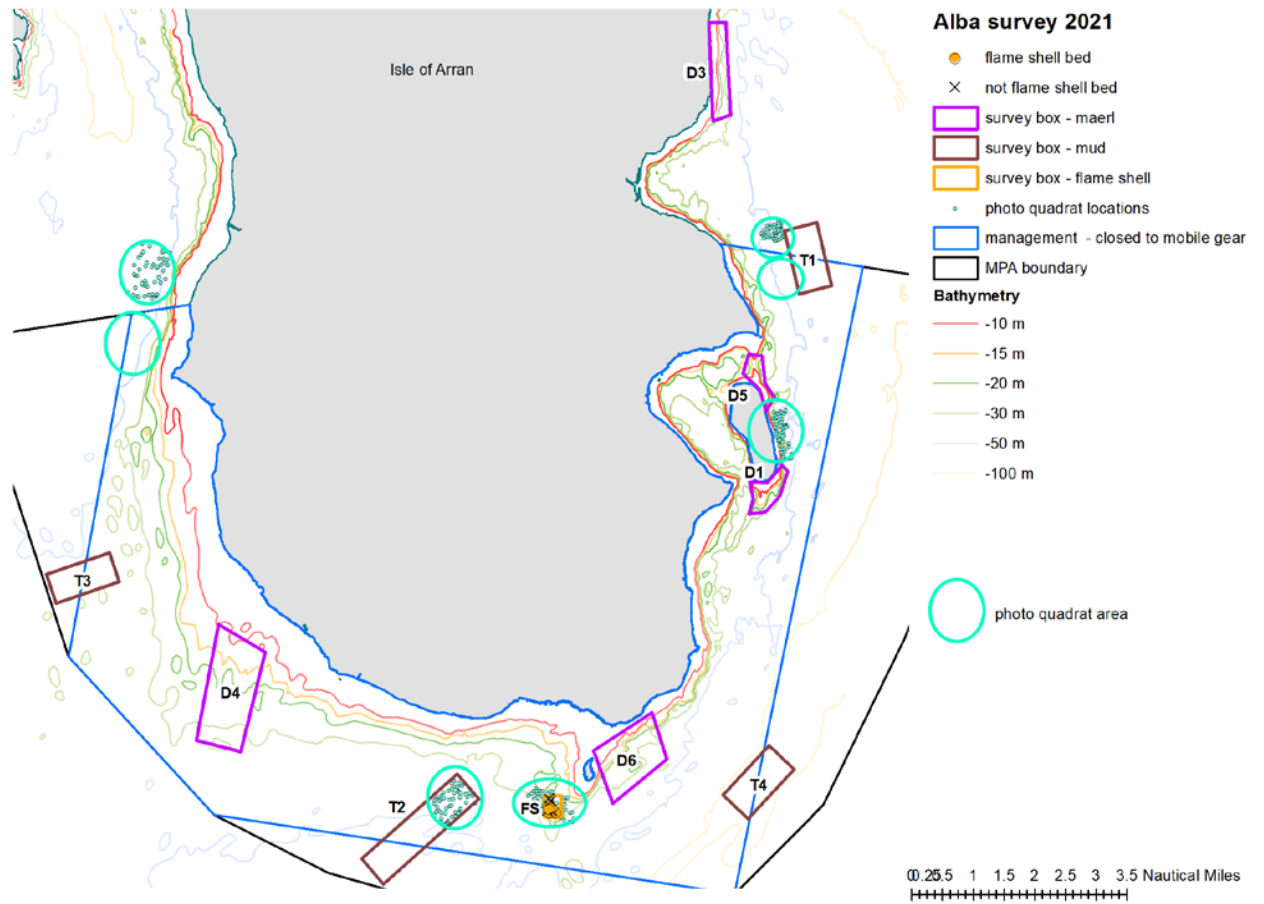


Figure 1: Overview Arran survey boxes and photo quadrat areas.

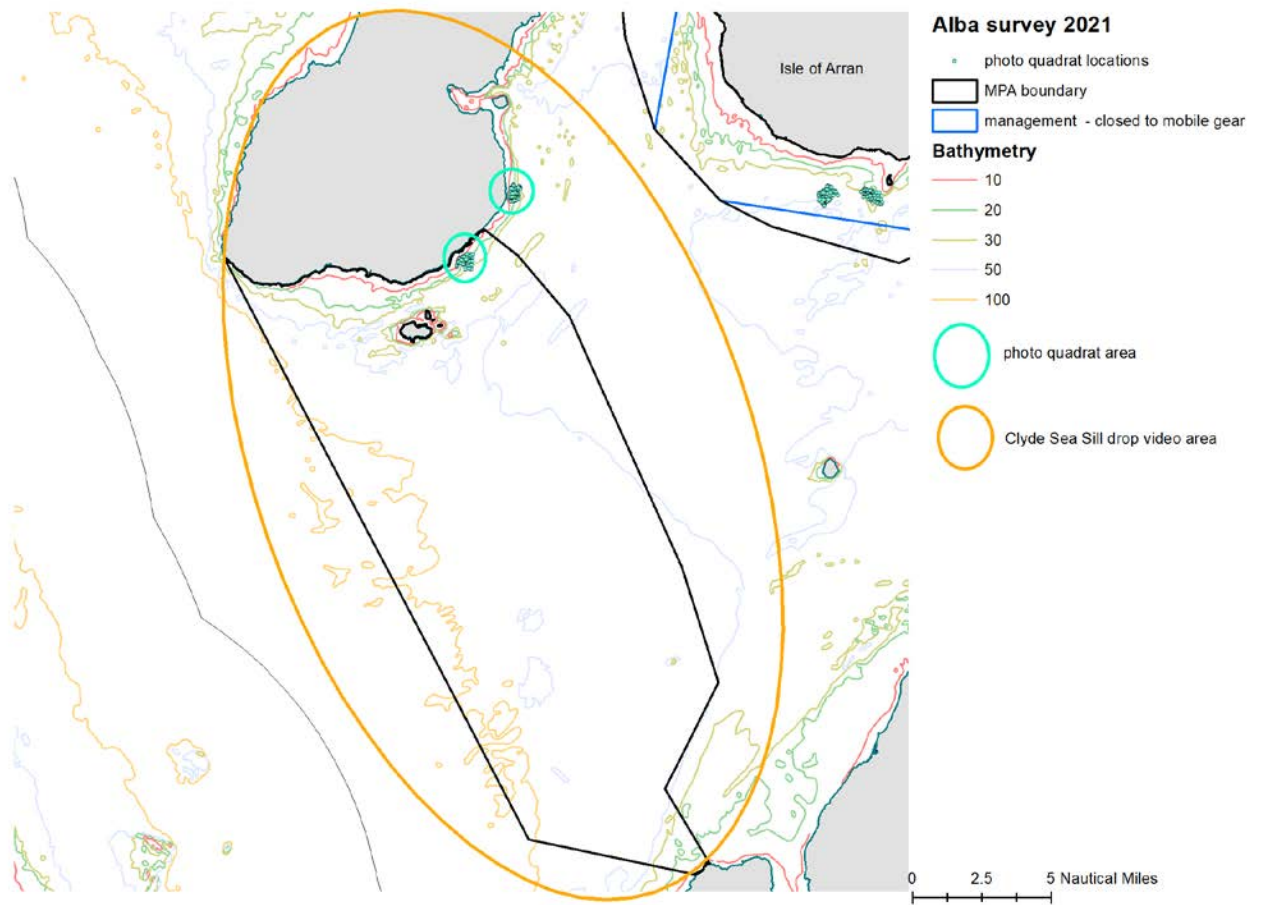
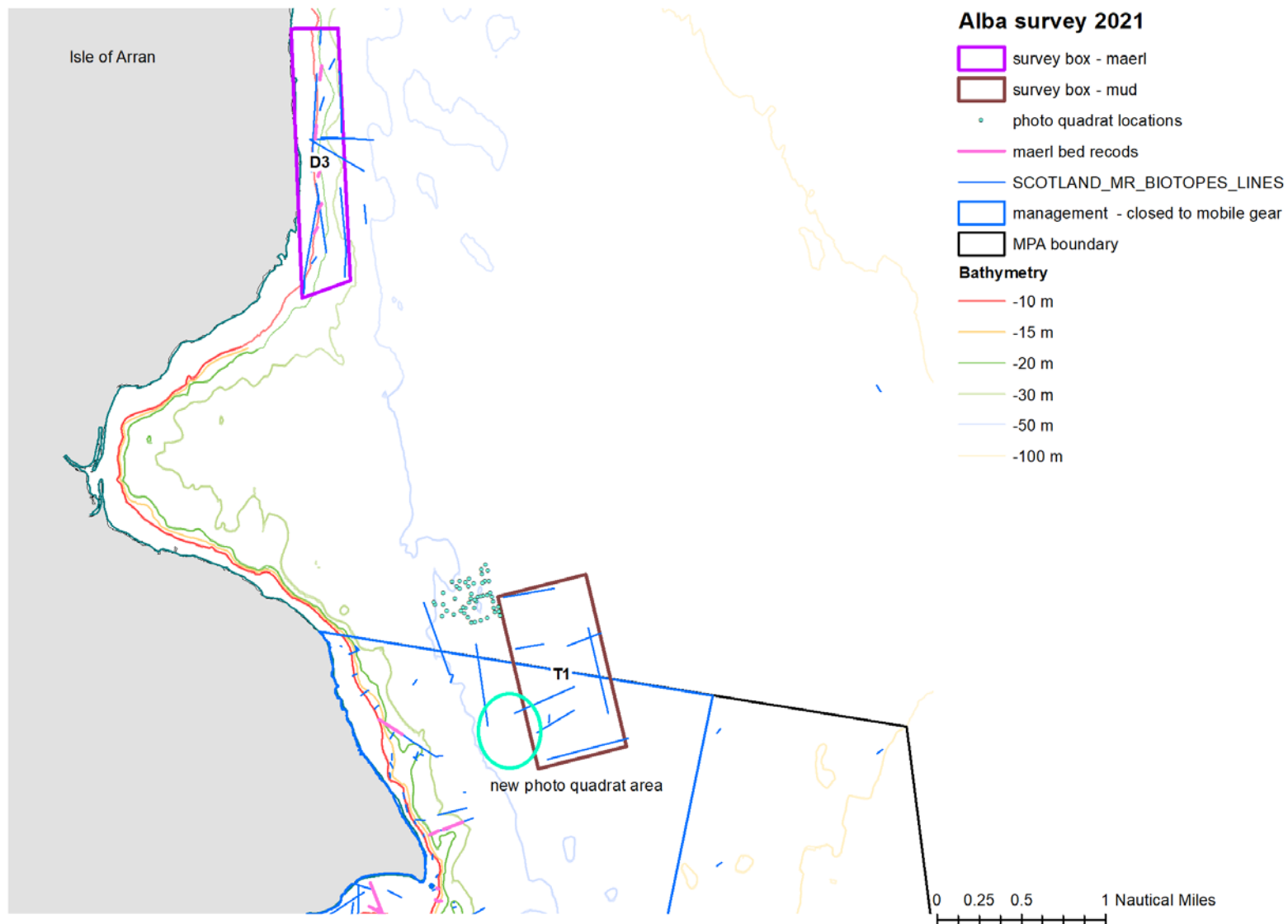
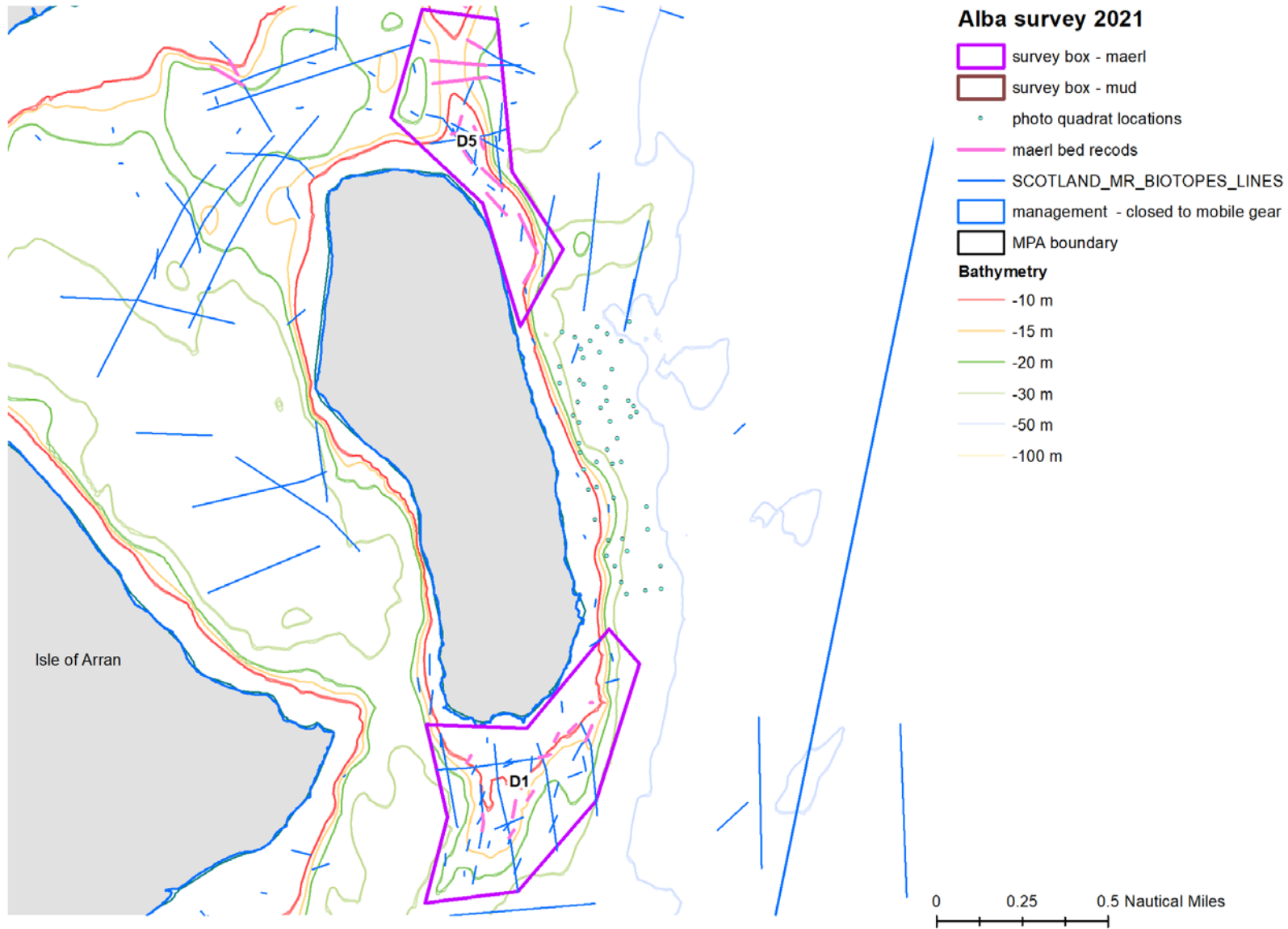
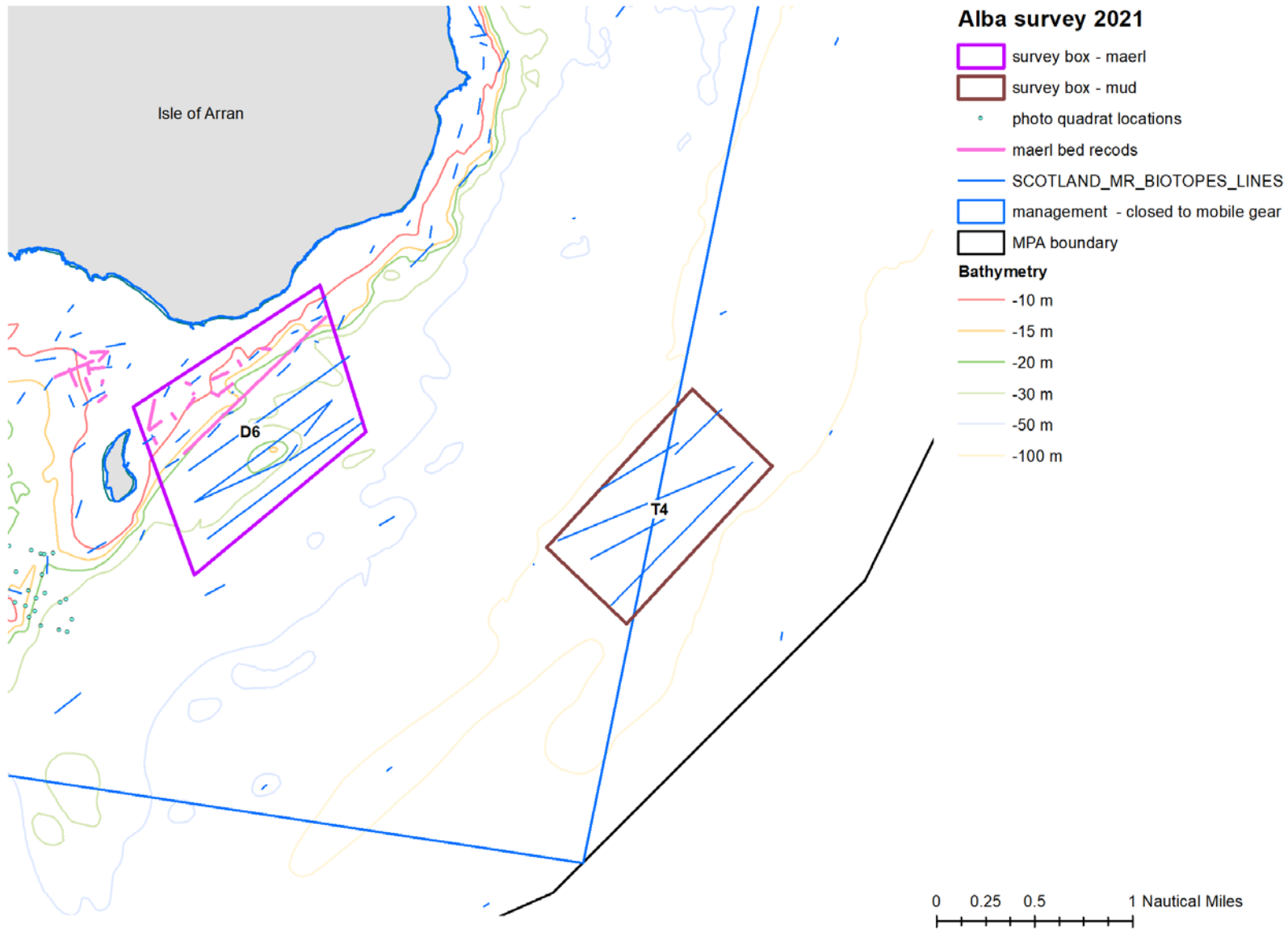


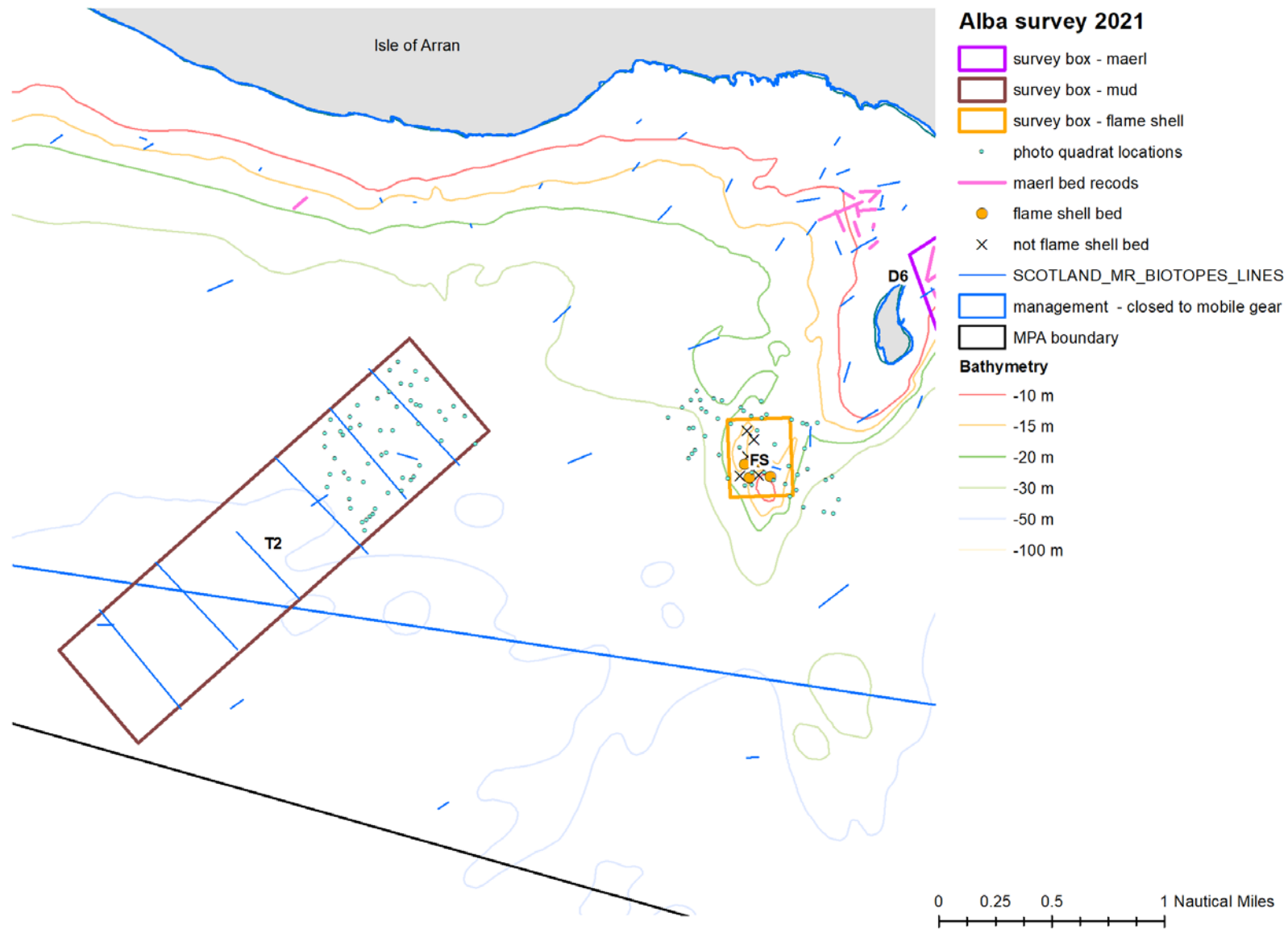
Figure 2: Overview Clyde Sea Sill and gap filling video survey area and photo quadrat areas.

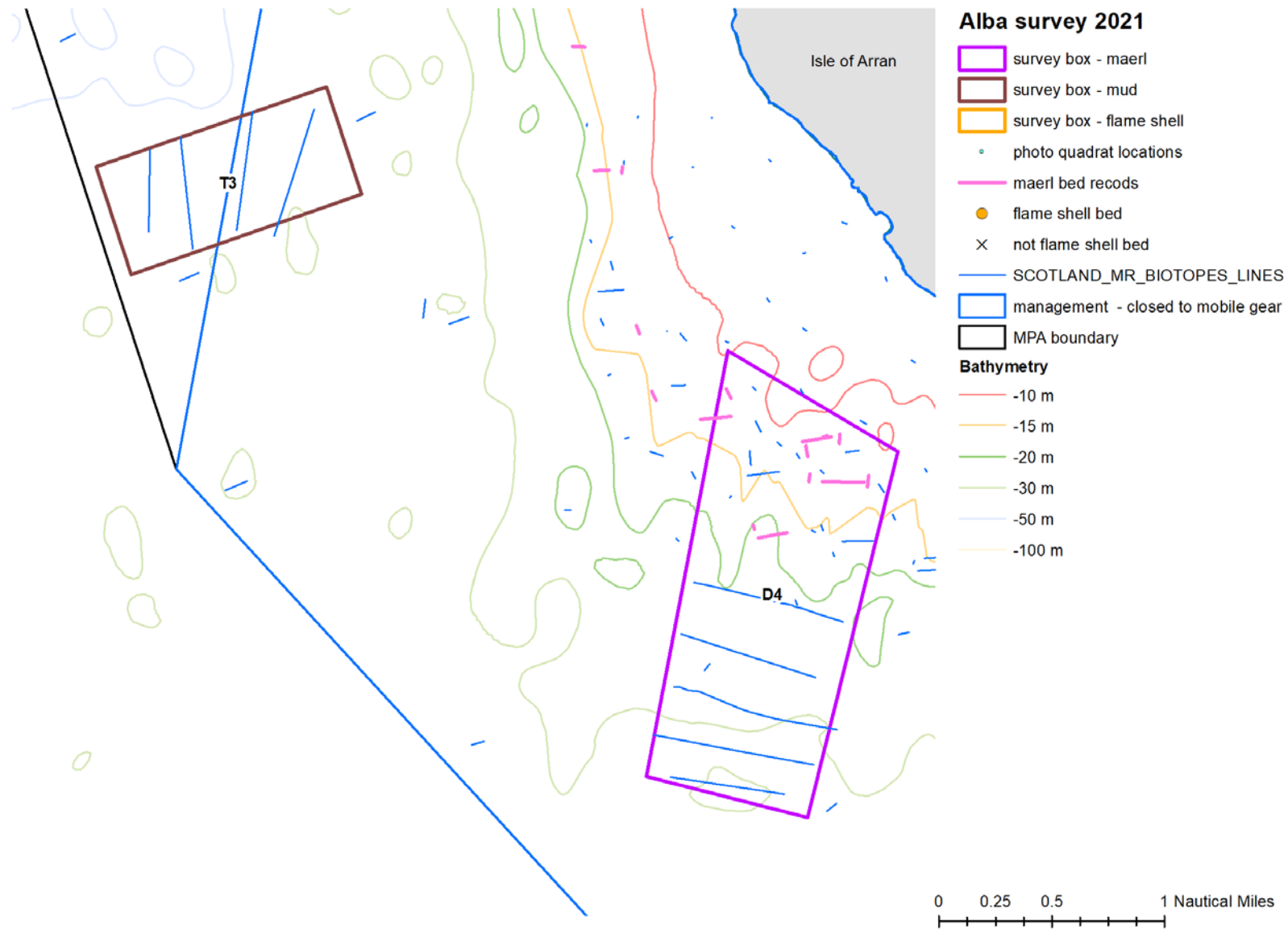
Detailed maps of Arran survey boxes and photo quadrat areas

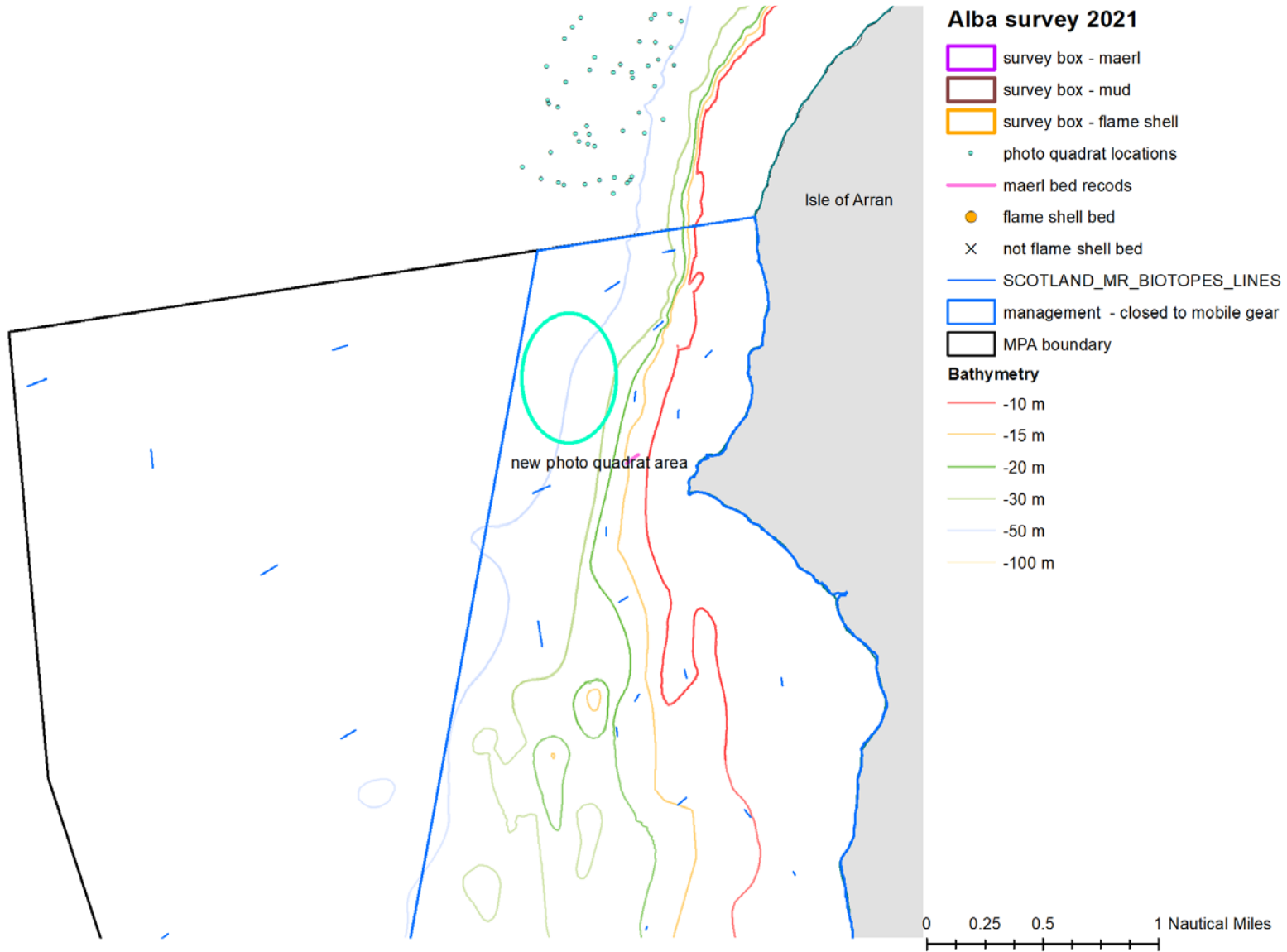




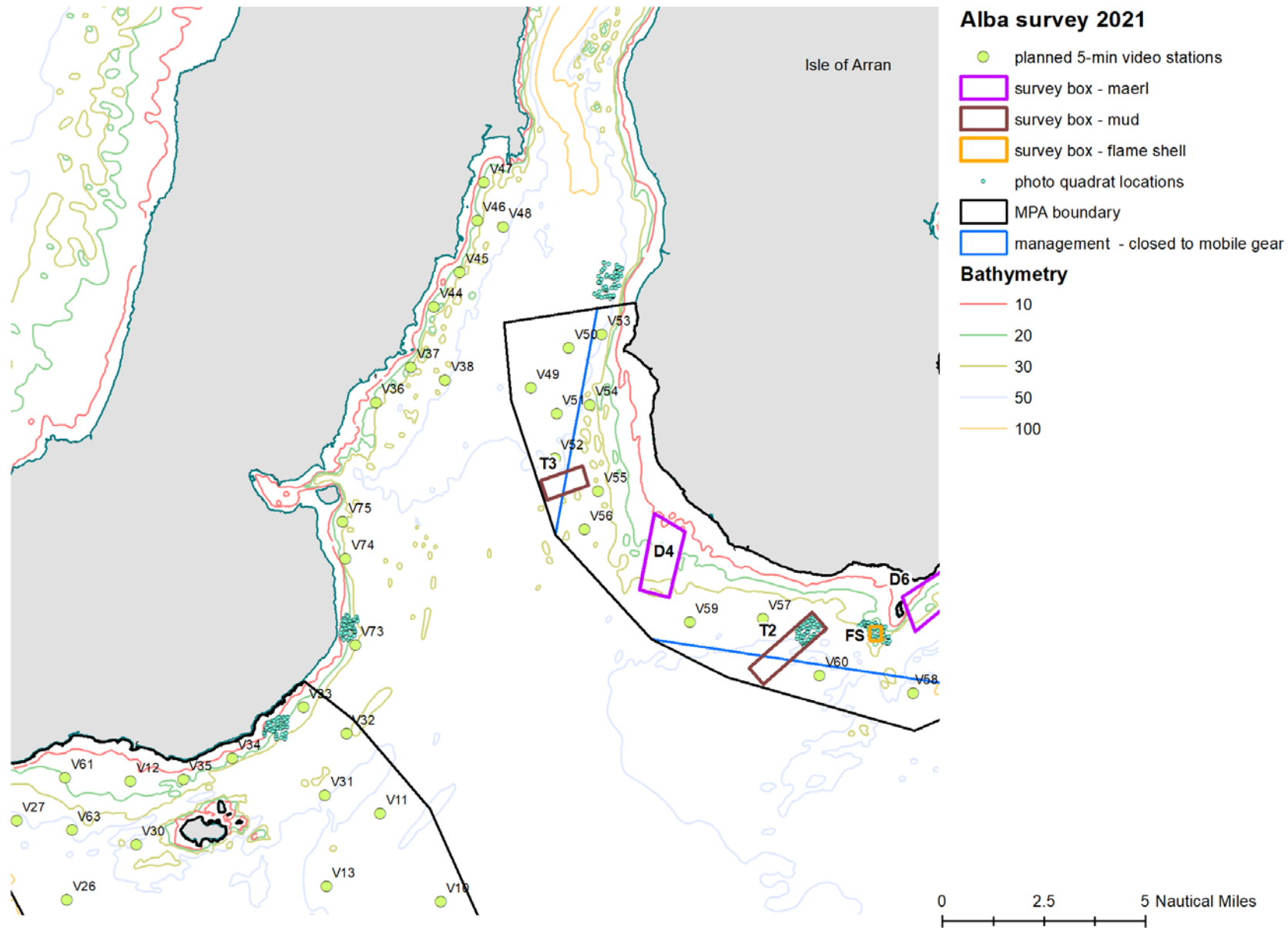


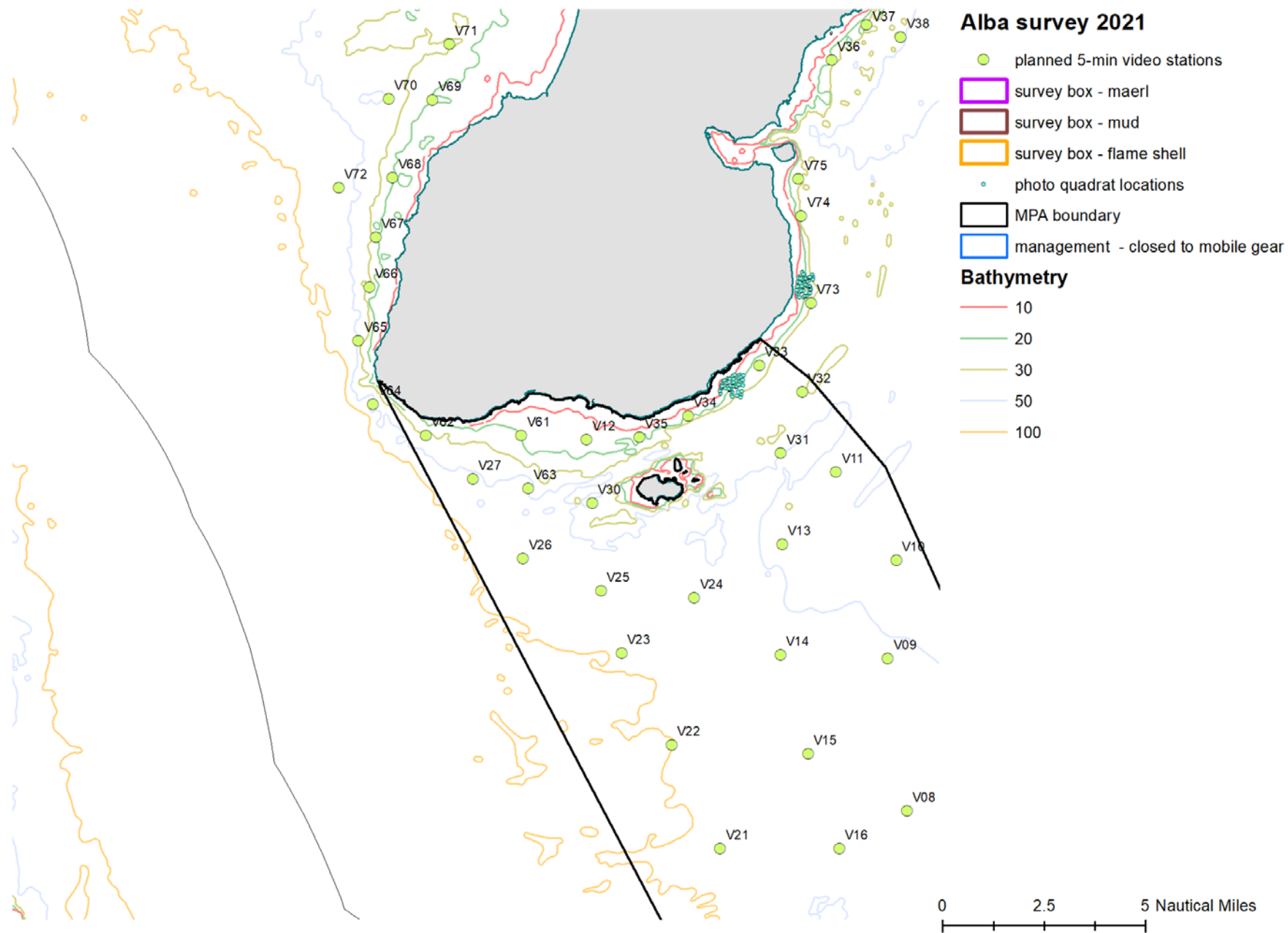


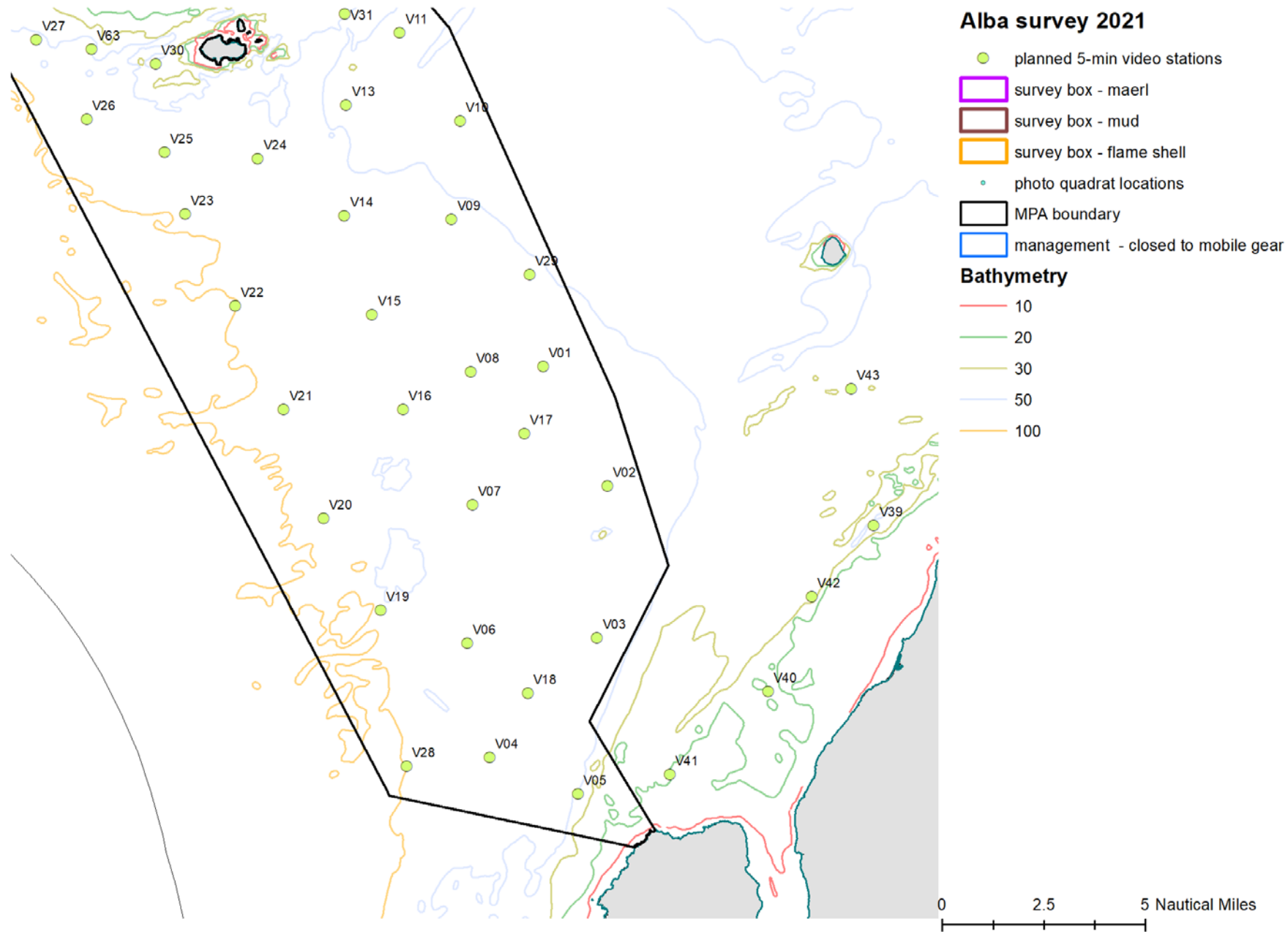




Detailed maps fo Clyde Sea Sill video stations and gap filling







Station details

Statio n	approx_de p	Lat	Long	Statio n	approx_de p	Lat	Long
V01	50-100	55.182714	-5.305414	V44	20	55.508349	-5.497739
V02	50-100	55.140848	-5.242046	V45	20	55.524236	-5.484489
V03	50-100	55.079743	-5.226618	V46	20	55.546229	-5.480080
V04	50-100	55.023542	-5.284681	V47	20	55.561868	-5.480974
V05	50	55.016546	-5.216838	V48	30	55.545694	-5.460434
V06	50-100	55.066824	-5.317734	V49	50	55.484403	-5.415981
V07	50-100	55.122007	-5.334888	V50	50	55.503357	-5.394835
V08	50-100	55.174554	-5.356216	V51	50	55.476331	-5.393462
V09	50-100	55.233165	-5.392780	V52	50	55.458393	-5.387838
V10	50	55.272897	-5.401596	V53	50	55.511605	-5.373425
V11	50	55.302667	-5.458118	V54	50	55.482525	-5.371275
V12	15	55.294194	-5.640651	V55	50	55.449036	-5.351923
V13	50	55.269386	-5.485187	V56	50	55.432814	-5.356024
V14	50-100	55.225458	-5.469527	V57	50	55.412157	-5.215126
V15	50-100	55.188809	-5.434866	V58	50	55.395223	-5.096466
V16	50-100	55.153811	-5.398336	V59	50	55.404714	-5.266495
V17	50-100	55.154426	-5.308761	V60	50	55.394318	-5.165772
V18	50-100	55.052054	-5.267339	V61	20	55.290120	-5.687789
V19	50-100	55.072545	-5.383930	V62	30	55.281873	-5.755833
V20	50-100	55.103982	-5.438235	V63	50	55.269868	-5.674774
V21	50-100	55.143706	-5.482994	V64	50	55.289658	-5.798183
V22	50-100	55.180627	-5.533184	V65	50	55.313464	-5.818499
V23	50-100	55.212595	-5.582835	V66	30	55.335613	-5.819243
V24	50-100	55.240678	-5.539710	V67	20	55.355879	-5.822159
V25	50-100	55.235438	-5.607145	V68	20	55.380851	-5.819648
V26	50-100	55.241756	-5.667510	V69	20	55.415183	-5.803326
V27	50-100	55.268889	-5.715465	V70	30-50	55.411759	-5.834812
V28	50-100	55.013148	-5.342109	V71	30	55.438612	-5.800189
V29	50-100	55.217824	-5.329074	V72	50-100	55.372331	-5.856379
V30	50-100	55.269571	-5.626872	V73	20-30	55.367414	-5.501731
V31	50	55.305378	-5.500271	V74	30	55.400949	-5.522027
V32	30-50	55.331529	-5.494386	V75	30	55.415372	-5.529819
V33	20-30	55.338300	-5.529032				
V34	20	55.312147	-5.571995				
V35	20	55.299482	-5.603437				
V36	20	55.465304	-5.524426				
V37	20	55.482196	-5.504705				
V38	30-50	55.480079	-5.478320				
V39	20-30	55.147227	-5.047033				
V40	20-30	55.072759	-5.097287				
V41	20	55.031712	-5.154795				
V42	30	55.114002	-5.080726				
V43	30	55.199473	-5.083274				