



**POSEIDON Bird and Marine Mammal Aerial Surveys for the
Southwest Celtic Sea**

Natural England

P00011684

Survey Report: April – June 2024 (seasonal)

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Revision and Amendment Register

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1. Introduction

Natural England contracted APEM Ltd (APEM) to undertake a second-year programme of four seasonal aerial digital surveys within the South-West Celtic Sea (Figure 1), commencing October 2023. This programme will repeat the four year-one seasonal aerial digital surveys of the same study area completed by APEM from 2022 – 2023. The purpose of the surveys is to provide information on the distribution and abundance of birds and marine megafauna within the survey area.

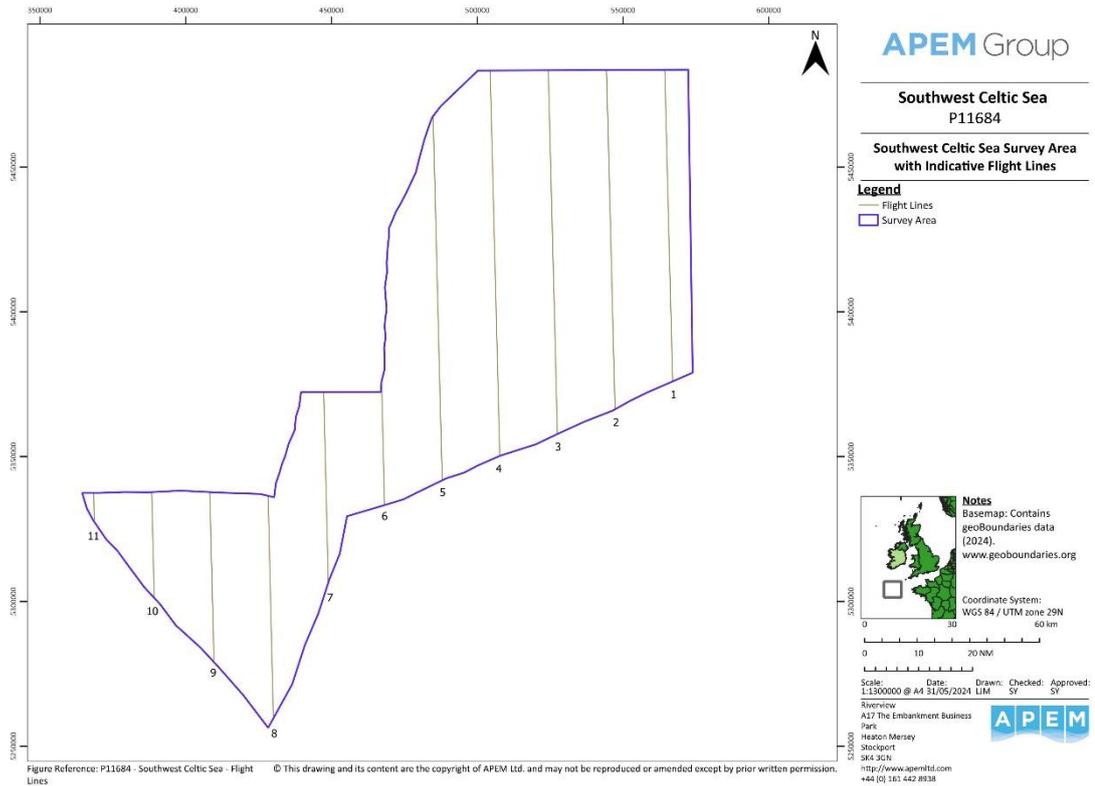


Figure 1 Location of the SW Celtic Sea site

2. Summary of Survey

The third (April to June 2024 seasonal) aerial survey was undertaken across two days. Flights occurred on the 2nd and 5th of June 2024 using a Vulcanair P68 twin-engine survey aircraft and a Diamond DA-42 MPP aircraft. The survey involved high-resolution digital still image collection using a GPS-linked bespoke flight management system to ensure tracks were flown with a high degree of accuracy.

The survey comprised 11 transects orientated in an east-west direction and the aircraft captured imagery at approximately 1.5 cm Ground Sampling Distance (GSD) with a survey altitude of 1,300 ft. Line 3 was flown between 1,200 and 1,300 ft due to patches of low cloud. The lowest altitude was still within the survey tolerances. All survey lines were flown. A total of 6,402 image nodes were captured, and the approximate coverage was calculated to be 3.30% (Table 1).

On the 2nd of June, two planes were used to survey lines 3-5 (take off at 12:25, landing at 17:49), and 6-11 (take off at 11:51, landing at 17:45), respectively. It was not possible to continue the survey on this date due to low cloud in the south of the Survey Area.

On the 5th of June, lines 1-2 were surveyed (take off at 12:00, landing at 16:07). Initial analysis of imagery from 2nd June indicated lines 6-7 and 9-11 were obscured by low cloud. A second plane therefore resurveyed the affected lines (take off at 07:17, landing at 12:35). Therefore, images to be used in analysis were taken on 2nd June for lines 3, 4, 5 and 8, and were taken on 5th June for all other lines.

On the 2nd of June, clouds were clear to broken (0-60% cloud cover). Visibility was 7- >10 km throughout the survey. Winds of 17-29 knots (Beaufort Scale 4-6) blew from a northeasterly to easterly direction and sea state was recorded as 2 (smooth, wave height 0.10-0.50 m). Outside temperature was 12-13°C. Turbidity was 0-2 (clear to moderately turbid).

On the 5th of June, clouds were scattered to broken (30-75% cloud cover). Visibility ranged from 7 to >10 km throughout the survey. Winds of 10-19 knots (Beaufort Scale 3-5) blew from a north-northeast to east-northeast direction and sea state was recorded as 2-3 (smooth to slight, wave height 0.10-1.25 m). Outside temperature was 10°C. Turbidity was 0-1 (clear to slightly turbid).

A summary of weather descriptions is given in Table 3. Weather details are recorded by air crew during surveys. Sea state and turbidity were visually estimated. Temperature and wind speed were recorded using the aircraft instruments.

No health and safety issues were reported during the survey.

Table 1 Summary of image capture and other observations

Survey line	N cameras capturing images	N image nodes	Camera issues*	Shipping observations	Anecdotal observations	Health and Safety issues
1	3	762	-	-	-	-
2	3	829	-	-	-	-
3**	3	889	-	-	-	-
4	3	940	-	-	-	-
5	3	891	-	-	-	-
6***	3	308	-	-	-	-
7***	3	471	-	-	-	-
8	3	547	-	-	-	-
9***	3	421	-	-	-	-
10***	3	265	-	-	-	-
11***	3	79	-	-	-	-

*Due to the vast number of capture points collected during a survey it is not uncommon for camera systems to sometimes miss capture points. Typically, the number of missed capture points is low and random across the site. APEM collected additional data to ensure the required coverage was captured. Additionally, APEM’s onboard camera technician monitored data as it was being captured. Surveys are aborted or lines re-surveyed if camera issues impact data collection.

**The system went offline on the initial line 3 survey attempt. The issue was resolved, and the line immediately resurveyed to ensure coverage. All details for line 3 within this report refer to the successful resurvey.

***Low cloud cover affected images on lines 6, 7, 9, 10 and 11 on the initial survey attempts on 2nd June. Each of these lines was resurveyed on 5th June. All details for lines 6, 7, 9, 10 and 11 within this report refer to the successful resurvey.

Table 2 Summary of survey conditions

Survey line	Date	Time on line (start / end)	Ground Speed (kts)	Cloud cover (%)	Visibility (km)	Outside temperature (°C)	Wind speed (kts)	Wind direction	Sea state (Douglas)	Turbidity
1	05/06/2024	14:12 / 14:42	121	30	7	10	10	20°	2	0
2	05/06/2024	13:27 / 14:05	120	70	8	10	19	60°	2	0
3	02/06/2024	16:28 / 17:01	120	25	>10	12	23	30°	2	2
4	02/06/2024	15:35 / 16:16	118	0	>10	12	29	70°	2	2
5	02/06/2024	14:52 / 15:26	123	0	>10	13	23	45°	2	2
6	05/06/2024	10:44 / 10:56	125	75	>10	10	13	35°	3	1
7	05/06/2024	10:20 / 10:38	125	75	>10	10	10	45°	3	1
8	02/06/2024	14:42 / 15:03	120	60	7	13	17	80°	2	0
9	05/06/2024	09:51 / 10:06	125	75	>10	10	13	45°	3	1
10	05/06/2024	09:35 / 09:45	120	75	>10	10	10	45°	3	1
11	05/06/2024	09:21 / 09:24	125	75	>10	10	13	30°	3	1

3. Shipping Observations

No vessels were observed from the aircraft in the April – June 2024 seasonal survey.

4. Anecdotal Observations

No anecdotal observations were made in the April – June 2024 seasonal survey.

5. Appendices

Table 3 Explanation of weather conditions

Wind (Beaufort Scale)			Douglas Sea State			Cloud cover (%)		Turbidity	
Scale	Description	Mean wind speed (knots)	Scale	Description	Wave height	% Cover	Description	Scale	Description
0	Calm	0	0	Calm (glass)	No wave	0	Clear	0	Clear
1	Light air	2	1	Calm (rippled)	0 – 0.10 m	1-10	Few	1	Slightly Turbid
2	Light breeze	5	2	Smooth	0.10 – 0.50 m	11-50	Scattered	2	Moderately Turbid
3	Gentle breeze	9	3	Slightly Moderate	0.50 – 1.25 m	51-95	Broken	3	Highly Turbid
4	Moderate breeze	13	<i>Surveys not typically flown at sea states > 3.</i>			96-100	Overcast		
5	Fresh breeze	19	4	Moderate	1.25 – 2.50 m				
6	Strong breeze	24							
7	Near gale	30							
8	Gale	37							