



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

Natural England

P00011684

Survey Report: October – December 2023 (seasonal)

Steven Young, Maria Player

Revision and Amendment Register

Version Number	Date	Section(s)	Page(s)	Summary of Changes	Approved by
1.0	06/12/2023	All	All	Creation	MP
1.1	12/12/2023	All	All	Internal Review	GJ
1.2	18/12/2023	All	All	PM Review	SY
1.3	16/01/2023	All	All	Client Comments	SY

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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.

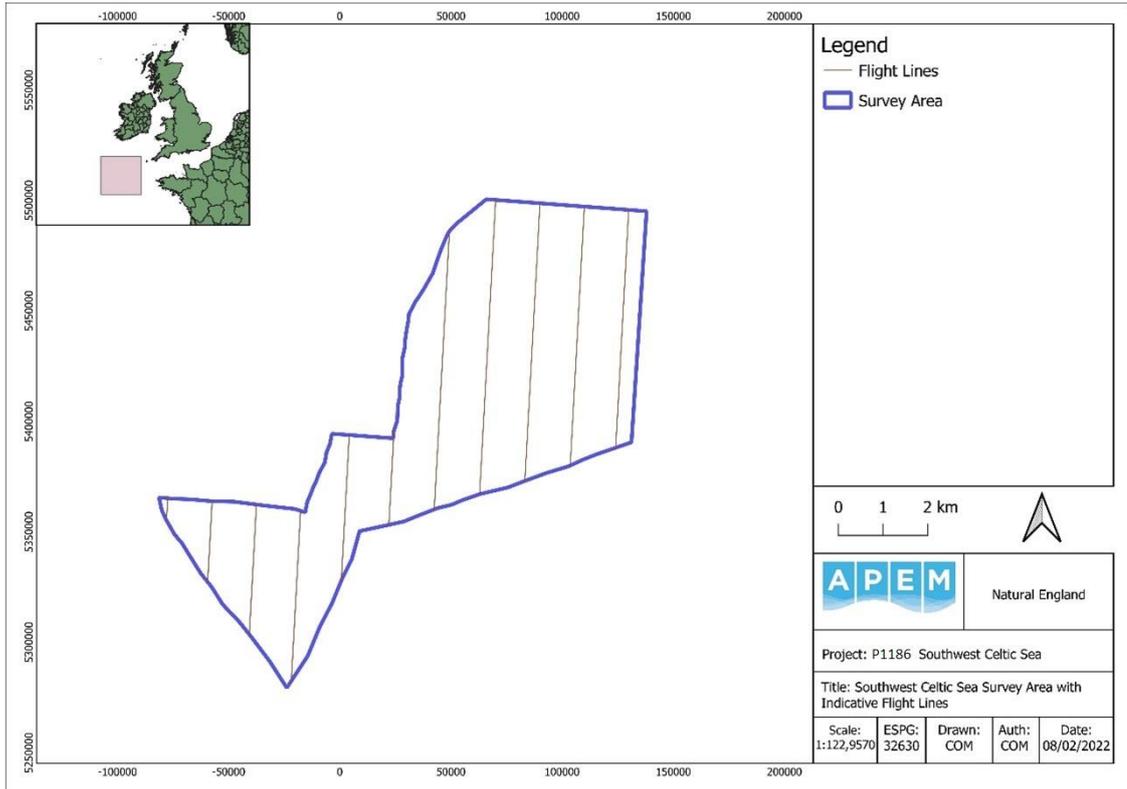


Figure 1 Location of the SW Celtic Sea Survey Area

2. Summary of Survey

The first year two (October to December 2023 seasonal) aerial survey was undertaken across three days. Flights occurred on the 21st, 22nd and 23rd of November 2023 using Vulcanair P68 twin-engine survey aircraft. Due to very low cloud, the lines flown on the 22nd of November were re-flown on the 23rd of November. 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 12 transects orientated in an east-west direction and the aircraft capturing imagery at approximately 1.5 cm Ground Sampling Distance (GSD) with a survey altitude of 1,300 ft. All survey lines were completed.

The initial survey attempt on line 10 on 21st November was unsuccessful due to an issue with camera flushing – a minor and easily-resolved hardware issue in which the camera's memory fills faster than images are saved, resulting in missed nodes. The issue was resolved and successful resurvey of line 10 was completed the same day.

Total coverage was calculated to be 3.3% captured and 3.3% analysed, generated from 6,396 image nodes (Table 1).

On the 21st of November, two planes were used to survey lines 1 to 5 (take off at 10:37, landing at 16:57), and 8 to 11 (take off at 10:51, landing at 16:21), respectively. The initial attempt to survey line 10 was unsuccessful due to camera flushing. Once the issue was rectified, the line was immediately re-surveyed.

On the 21st of November, clouds were broken (50-70% cloud cover). Visibility remained at greater than 10 km throughout the survey. Winds of 14-28 knots (Beaufort Scale 5) blew from a northerly direction and sea state was recorded as 2-3 (smooth to slightly moderate, wave height 0.3-1 m). Outside air temperature was 8-9°C. Turbidity was 1-2 (slightly turbid to moderately turbid).

On the 22nd of November, one plane was used to survey lines 6 and 7 (take off at 09:33, landing at 14:00). However, low cloud prevented image capture. Therefore, these lines were re-surveyed on 23rd of November (take off at 11:39, landing at 15:37).

On the 23rd of November, clouds were overcast (100% cloud cover). Visibility remained at greater than 10 km throughout the survey. Winds of 10 knots (Beaufort Scale 3) blew from a north easterly direction and sea state was recorded as 1 (Calm [Rippled]), wave height 0 to 0.1 m). Outside temperature was 8°C. Turbidity was 1 (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	757	-	-	-	-
2	3	829	-	-	-	-
3	3	888	-	-	-	-
4	3	941	-	-	-	-
5	3	891	-	-	-	-
6	3	308	-	-	-	-
7**	3	471	-	-	-	-
8	3	547	-	-	-	-
9	3	420	-	-	-	-
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.

**Very low cloud cover made images unusable on the initial lines 6 and 7 survey attempts on 22nd November. The lines were resurveyed on 23rd November to ensure coverage. All details for lines 6 and 7 within this report refer to the successful resurvey.

***There was an issue with a camera flushing on the initial line 10 survey attempt. The issue was resolved, and the line resurveyed the same day to ensure full coverage. All details for line 10 within this report refer to the successful resurvey.

Table 2 Summary of survey conditions

Survey line	Date	Time on line (start / end)	Ground Speed (knts)	Cloud cover (%)	Visibility (km)	Outside temperature (°C)	Wind speed (knts)	Wind direction	Sea state (Douglas)	Turbidity
1	21/11/2023	15:03 / 15:30	125	60	10+	8	22-28	0°	2	1
2	21/11/2023	14:16 / 14:57	120	60	10+	8	22-28	0°	2	1
3	21/11/2023	13:35 / 14:08	130	50	10+	8	22	0°	2	1
4	21/11/2023	12:44 / 13:28	105	50	10+	8	22	0°	2	1
5	21/11/2023	12:02 / 12:35	130	50	10+	8	22	0°	2	1
6	23/11/2023	13:17 / 13:28	119	100	10+	8	10	60°	1	1
7	23/11/2023	13:40 / 14:00	107	100	10+	8	10	60°	1	1
8	21/11/2023	14:03 / 14:25	120	70	10+	9	18	350°	3	2
9	21/11/2023	13:35 / 13:51	120	70	10+	9	18	340°	3	2
10	21/11/2023	13:16 / 13:24	120	70	10+	8	14	350°	3	2
11	21/11/2023	12:40 / 12:43	130	70	10+	9	20	350°	3	2

3. Shipping Observations

No vessels were observed from the aircraft.

4. Anecdotal Observations

No anecdotal observations were made.

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							