# Static Acoustic Monitoring of the presence of Dolphins (Dusty) at White Strand, Miltown Malbay, Co Clare

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COMHAIRLE CONTAE AN CHLÁIR CLARE COUNTY COUNCIL

and produced by

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## Summary

Static Acoustic Monitoring (SAM) was undertaken at White Strand, Miltown Malbay, Co Clare between 13 June and 5 September 2026, to explore the use of the bay by the solitary dolphin known as "Dusty". A visual log of all dolphin sightings was made opportunistically during the deployment period, suggesting that all acoustic detections were of Dusty. The acoustic dataset recorded contained 245 Detection Positive Minutes (DPMs) over the monitored period, and were logged on between 65-83% of days, with a mean of 72% of days monitored with detections. Detections occurred equally during both daylight and night-time hours. There was evidence of foraging, with 5% of clicks overall associated with foraging click-trains. An acoustic detection coincided with a visual sightings on only 12 occasions on 9 separate days. The relatively low overlap (15.2%) was surprising. A number of reasons are discussed including whether Dusty is using a wider range of vocalisations other than clicks, which would not be logged by the CPOD. These data provide a new insight into how the dolphin known as Dusty uses White Strand during summer months suggesting the bay is an important part of her home range but that also the potential for interaction between Dusty and trainee lifeguards might also be higher than expected.

## Introduction

Static Acoustic Monitoring (SAM) was undertaken in White Strand, Miltown Malbay, Co Clare, to describe the occurrence of dolphins in the bay. It is well known that Dusty, a solitary dolphin frequently occurs in the bay but detailed data on her presence is lacking. Clare Water Safety have their training centre at White Strand and obtained a license from the National Parks and Wildlife Service to use a pinger to deter Dusty from the bay during nipper training due to safety concerns. In order to explore in more detail the use of the bay but dolphins (primarily Dusty) the Irish Whale and Dolphin Group (IWDG) deployed a device called a CPOD from June to September to provide data on the use if the bay to inform management of the area.,

This report examines daily and hourly acoustic dolphin detections, their distribution across daylight and night-time hours, the presence of foraging trains and the temporal correlation with acoustic detections and visual sightings.

## Methods

A C-POD (Chelonia Ltd., UK; device 3529) was deployed at White Strand between 13 June and 5 September 2026 in the centre of the bay (see Figure 1.) A C-POD contains an omnidirectional hydrophone operating over between 20 to 160 kHz and select possible cetacean clicks according to frequency, duration, intensity and bandwidth. Temperature and instrument angle relative to vertical are also logged at one-minute intervals (www.chelonia.co.uk). C-POD data processing uses the manufacturer's cpod.exe software and KERNO classifier to identify coherent click trains and classify their acoustic characteristics. This distinguishes narrowband high frequency cetaceans, including harbour porpoises, from broadband cetaceans such as dolphins. A detection positive minute (DPM) is a minute containing at least one selected click train; it measures acoustic occurrence, not animal abundance.The detection distance is around 700m (O'Brien *et al.* 2013) thus given the bay is only 300m wide at this point all echolocation clicks should have been logged if the dolphin entered the swim area inside the bay.

All data collected during the monitoring period (n=85 days), was extracted over daily and per minute timeframes. Daily and hourly totals were calculated by summing minutes/days with total DPMs. The daily summary file also measured temperature values and instrument angle relative to vertical over the duration.

Sunrise and sunset times were calculated using NOAA's published solar position equations, with a solar zenith threshold of 90.833° for Miltown Malbay (52.85°N, 9.40°W) (https://aa.usno.navy.mil/data/RS_OneYear). Each recorded minute was classified as daylight between sunrise and sunset, or night otherwise; twilight was included in night. Diel detection rates were

calculated as DPM divided by the number of supplied minute records in each category, multiplied by 100.




**Figure 1. Location of CPOD at White Strand, Miltown Malbay, Co Clare (with estimated detection range of 700m indicated by circle)**

Potential foraging activity was explored using the method followed Carmen *et al.* (2021). Only dolphin click trains assigned to the high and moderate quality categories in CPOD.exe were retained. The minimum inter-click interval (minICI) was extracted for each accepted train, and trains with a minICI of less than 10 ms were classified as indicative of potential foraging. The analysis used within-train minICIs rather than intervals between separate trains. These classifications were interpreted as an acoustic proxy for foraging activity rather than confirmation of successful prey capture. Detections were analysed at the dolphin-group level because species identity could not be reliably established from C-POD data alone.

A log was made of any visual sightings of Dusty made by lifeguards on duty at the Clare Water Safety office from the day of deployment (13 June) to 6 September, 2026. A visual entry was matched with an acoustic detection when an acoustic minute occurred within an inclusive ±1 hour window around its timestamp.

## Results

The CPOD worked for the entire deployment period of 85 days. Dolphin acoustic activity was recorded on 61 of the 85 day deployment period (71.8%), and totalled 245 Detection Positive Minutes (DPMs) across the entire deployment period with a mean of 2.88 DPMs per day (Table 1; Table 2; Figure 2).

**Table 1. Acoustic monitoring summary derived from data extracted as DPM per day**

| Location | Period | Days | DPMs | No. of Positive days | Mean DPM/day |
|---|---|---|---|---|---|
| Miltown Malbay | 13 Jun - 5 Sep 2026 | 85 | 245 | 61 (71.8%) | 2.88 |

*Daily detections and temperature*

When presented by month, August had the most detections followed by July. Unfortunately. Not all days in the months of June and September were monitored but the mean DPMs per day in June and July were very similar, but much less in September (Table 2).

August accounted for 116 DPM (47.3% of the total), although detections occurred on fewer days than in July (Table 2). The largest daily total was 22 DPM on 22 August, followed by 16 on 30 August and 15 on 2 August (Figure 2).

**Table 2. Monthly acoustic detections for the selected monitoring period**

| Month | Total days Monitored | DPM | No. of Positive days (%) | Mean DPM/day |
|---|---|---|---|---|
| June | 18 | 47 | 14 (77.7%) | 2.61 |
| July | 31 | 81 | 26 (83.8%) | 2.61 |
| August | 31 | 116 | 20 (64.5%) | 3.74 |
| September | 5 | 1 | 1 (20%) | 0.20 |

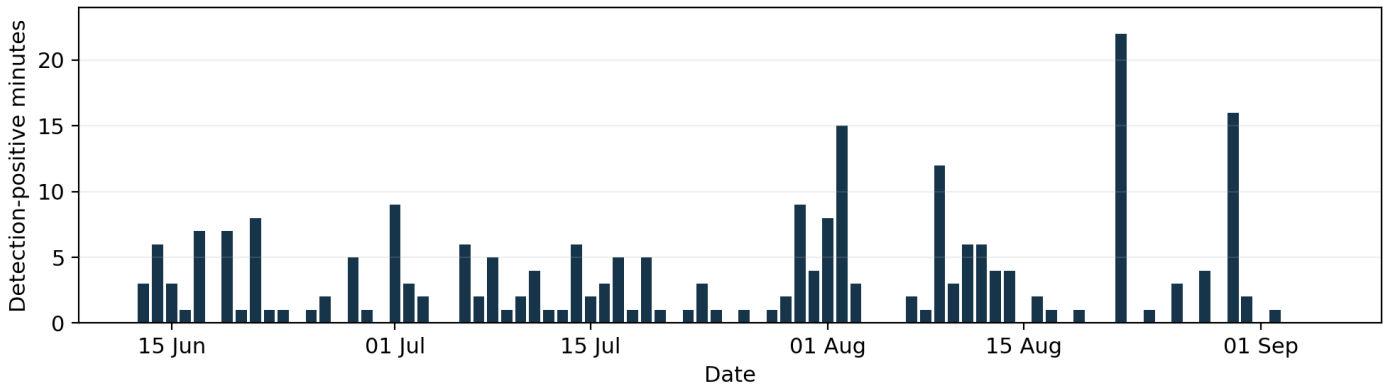



**Figure 2. Daily dolphin DPMs, 13 June to 5 September 2026 (85 days)**

The CPOD also records daily temperatures which averaged 14.6°C and ranged from 11.7°C to 16.5°C. Water temperature generally increased from June through to August before declining during late August (Figure 3).

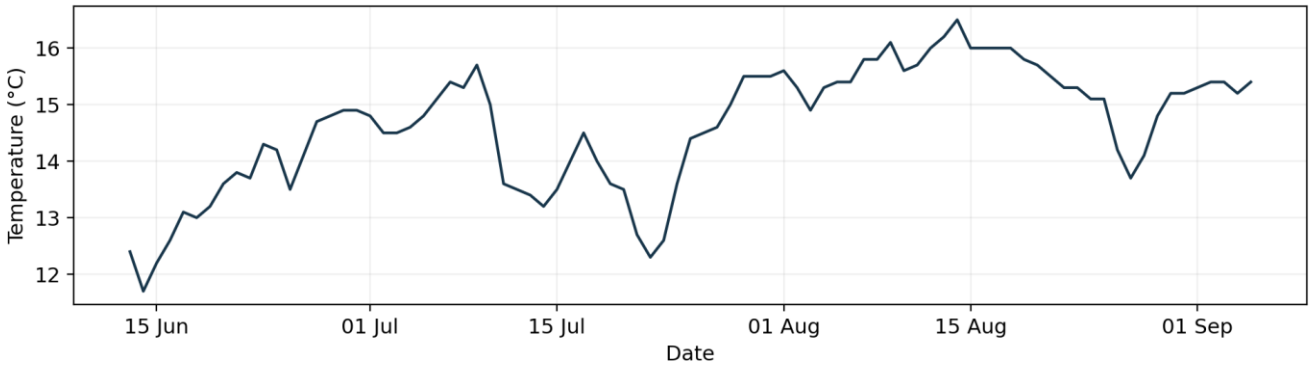



**Figure 3. Exported daily water temperature values over 13 June to 5 September 2026**

*Timing of acoustic detections*

Detections were distributed across both day and night, throughout the deployment (Figure 4) with a similar proportion of clicks logged during the day and night (Table 3). The largest hourly total was 28 DPMs between 01:00 and 01:59, followed by 23 DPMs between 13:00 and 13:59 (Figure 5).

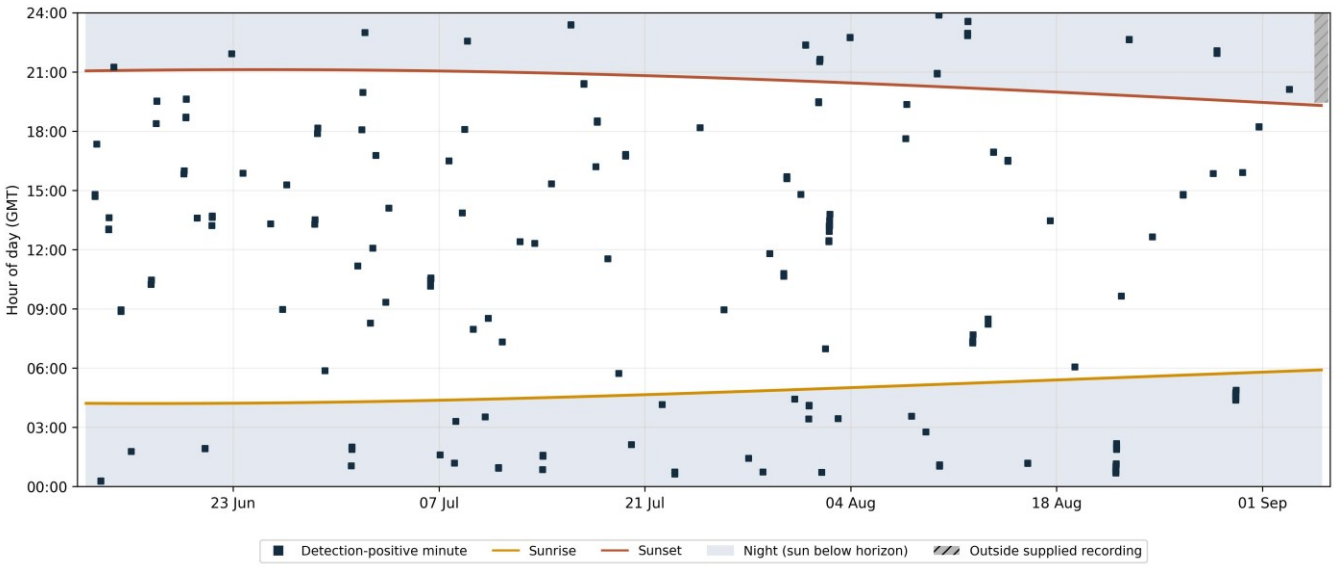



**Figure 4. Date and hour of dolphin detections, with approximate sunrise and sunset (orange line) and shaded area depicting night-time hours**

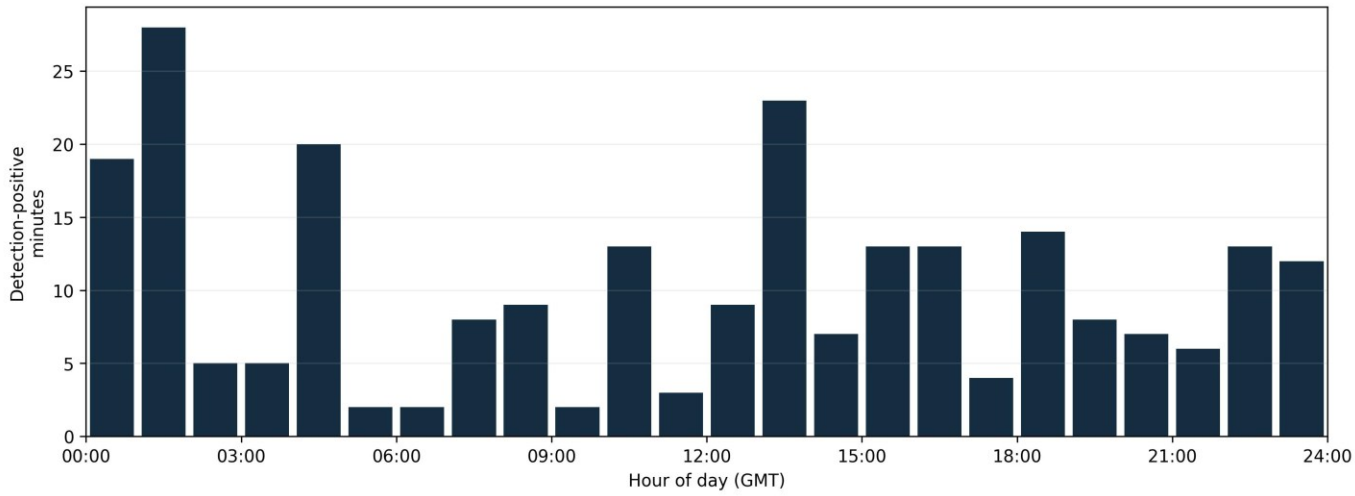



**Figure 5. Total dolphin Detection Positive Minutes by hour (using data from 13 June to 5 September 2026 combined)**

**Table 3. Number and percent of daytime and nighttime detections over monitoring duration**

| Period | DPM | % DPM |
|---|---|---|
| Daylight | 133 | 54.3% |
| Night | 112 | 45.7% |

*Click trains*

A total of 1,147 click trains were recorded between 13 June and 2 September 2026. Of these, 1,140 were classified as dolphin click trains of high or moderate quality and seven narrowband high frequency (NBHF) trains which were excluded from the analysis.

Applying the minimum inter click interval (minICI) threshold of <10 ms used by Carmen *et al.* (2021), 58 dolphin trains (5.1%) were classified as indicative of foraging, while 1,082 (94.9%) did not meet this threshold (Table 4). The foraging-positive trains comprised 14 high-quality and 44 moderate-quality detections, with minICIs ranging from 1.075 to 9.585 ms. These trains occurred in 21 distinct recorded minutes across nine dates.

Of the 58 foraging-positive trains, 11 occurred in July and 47 in August. The proportion of dolphin trains meeting the foraging criterion was 3.2% in July (11/343) and 8.0% in August (47/587) (Table 4). No trains met the criterion in June or September.

**Table 4. Monthly occurrence of dolphin click trains indicative of foraging, classified using the minimum inter click interval threshold (<10 ms) used by Carmen *et al*. (2021)**

| Month | Dolphin trains (n) | Foraging trains (n) | Foraging negative (n) | Foraging positive clicks (%) |
|---|---|---|---|---|
| June | 209 | 0 | 209 | 0 |
| July | 343 | 11 | 332 | 3.2 |
| August | 587 | 47 | 540 | 8.0 |
| September | 1 | 0 | 1 | 0 |
| Total | 1140 | 58 | 1082 | 5.1 |

*Visual and acoustic correspondence*

There were 79 sightings of Dusty across 41 days, plus one sighting of a pod of 15 bottlenose dolphins between 11:17 and 15:30 on 5 July 2026. Twelve sightings of Dusty (15.2%) matched an acoustic detection within ±60 minutes, on nine days (Table 5).

The 19 matched acoustic minutes represented 7.8% of all 245 DPMs, or 9.1% of the 209 DPMs recorded during the visual log period, 22 June to 5 September.

**Table 5. Visual sightings with acoustic matches ±60 minutes**

| Date | Visual time | Acoustic time |
|---|---|---|
| 25 June 2026 | 12:35 and 14:00 | 13:18 |
| 08 Jul 2026 | 13:38 and 13:42 | 13:51 |
| 08 Jul 2026 | 17:56 | 18:05 |
| 12 Jul 2026 | 11:30 | 12:34 |
| 18 Jul 2026 | 11:37 | 11:32 |
| 24 Jul 2026 | 18:50 | 18:10 |
| 29 Jul 2026 | 12:00 | 11:47 |
| 02 Aug 2026 | 14:00 | 13:10-13:14,13:27, 13:28, 13:47 |
| 17 Aug 2026 | 13:35 | 13:27 |
| **Total** | **12 sightings** | **19 acoustic minutes** |

## Discussion

This short study provides high-resolution data on the use of White Strand, Miltown Malbay by the solitary dolphin known as Dusty. Given the public interest following the issuing by the NPWS of a Derogation for the use of an acoustic deterrent (pinger), the IWDG consider it important to better understand how the dolphin uses the bay to assess potential interactions and impacts. The CPOD also cannot distinguish between dolphin species or individual dolphins, but only one sighting during the deployment period was of a group of bottlenose dolphins that passed by the entrance to the bay, and it's reasonable to assume all detections logged were emitted from Dusty.

The results from SAM show the dolphin uses the bay on a near daily basis between June and September with the proportion of days with detections between 65-83%, and a mean of 72% of days. August had the greatest highest recorded acoustic activity, but detections were more concentrated into fewer days than during July. The metric DPM captures minutes with selected echolocation activity and should not be interpreted as total time spent at the site, the number of animals, or a direct measure of Dusty's presence. It is also influenced on whether the dolphin is echolocating or withing the range of the equipment (approximately 700m for dolphins). Interestingly there was an equal presence during day and night, despite the shorter night time period (38% to 32% of total day) during the monitoring period.

There is some evidence to show Dusty forages in the bay. Results indicate some temporal variation in foraging activity due to the higher proportion of foraging trains in August than July, but differences in monitoring effort and detection conditions must be considered before drawing conclusions.

Acoustic detections were logged within an hour of a sighting on 12 of the 79 sightings on 9 separate days. The low overlap (15.2%) between visual sightings and acoustic logs was a little surprising but this does not demonstrate poor CPOD performance, or the absence of Dusty within detection range. We used 60 minutes as an overlap period between sighting and acoustic log. The lifeguards were asked to log any sightings of Dusty and they may not have necessarily logged sightings immediately as this was not their primary function and they are bust carrying out their duties. If the overlap period was extended then they is likely to be a stronger correlation between sightings and acoustic detections. All days with sightings also had acoustic detections. Also, the dolphin when observed close to shore may not be echolocating, or the dolphin is not directing its narrow beam towards the CPOD. Studies elsewhere of solitary dolphins (Filatova *et al.* 2024) recorded a wide range of whistles and other vocalisations despite not being in a social group, which Dusty might also be using rather than echolocation. We suggest static acoustic monitoring is an efficient way of assessing the use of the area by the solitary dolphin. Deploying a sound recorder in the bay would be of interest especially with simultaneous land-based visual observations.

In summary this short period of acoustic monitoring shows a higher use of White Strand by Dusty than may have been expected. It suggests the bay is an important part of her home range, but that also the potential for interaction between Dusty and trainee lifeguards is also maybe higher than anticipated.

## Acknowledgements

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