

Dolphin and Porpoise Watch:
Effects of Water User Encounters on Bottlenose
dolphin behaviour and site use
on the Ceredigion Coast, West Wales
2024

Melanie Heath and Ian Hughes

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Introduction

Dolphin Watch was established in response to a community led initiative which raised concerns that perceived increases in powered craft activity may have potential adverse effects on the local bottlenose dolphin population. In 1994, when the Dolphin Watch study first began, the aim was to obtain further information on the relationship between cetacean site use and boat traffic; this data would then help to guide future management of the then recently designated voluntary Marine Heritage Coast (MHC). The project was designed with the aim of encouraging local people to participate in monitoring the dolphins, to both build support for the MHC and to raise public awareness of the issue of boat disturbance. In 2018 the project was expanded to also include and promote the recording of harbour porpoise sightings in Cardigan Bay.

In 1996 an area in the south of Cardigan Bay was put forward as a candidate Special Area of Conservation (cSAC) under the EU Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora, 1992) because of its importance for the bottlenose dolphin population in Cardigan Bay.

In 2004 the Cardigan Bay Special Area of Conservation (SAC) was officially designated as an SAC. Stretching from Ceibwr Bay in Pembrokeshire to Aberarth in Ceredigion and extending almost 20km from the coast, Cardigan Bay Special Area of Conservation (SAC) protects the wildlife found in around 1000km² of sea. Cardigan Bay SAC forms part of a network of protected sites known as the Natura 2000 (N2K) network.

Dolphin Watch has now completed thirty years of data collection. This is the sixteenth Dolphin Watch survey report (Pierpoint and Allan 2000, 2001; 2002; 2004; 2006; Allan et al 2010; Sampson et al 2015, Perry 2016, Heath and Vaughan 2018, Heath and Vaughan 2019, Heath and Vaughan 2020, Heath and Vaughan 2022, Heath and Hughes 2025, Heath and Hughes (2022) 2026, Heath and Hughes (2023) 2026). A peer reviewed paper has also been published Pierpoint, C., Allan, L., Arnold, H., Evans, P., Perry S., Wilberforce, L and Baxter, J. (2009) Monitoring important coastal sites for bottlenose dolphin in Cardigan Bay, *Journal of the Marine Biological Association of the United Kingdom*. 89 (5): 1033-1043).

Please note: The year 2020 is the only year in the project's thirty year history to have an incomplete data set; this is due to the Covid 2019 pandemic and the measures put in place through lockdowns and activity restrictions until August 2020, so data was only collected in 2020 in a limited form. This data was used to inform site management; but did not provide a comparable data set to produce a report for the year 2020.

The key aims of the DPW project are:

- To monitor the presence of bottlenose dolphins and harbour porpoise to improve our understanding of bottlenose dolphin and porpoise site usage and to monitor trends in dolphin and porpoise occurrence
- To monitor levels of water user traffic to aid coastal zone management and to assess the effectiveness of the Cardigan Bay Marine Codes
- To Investigate interactions between bottlenose dolphins/ harbour porpoise and water users, and how these interactions affect dolphin and porpoise behaviour
- To increase public awareness and appreciation of the marine wildlife in Cardigan Bay

Method

In 2024 bottlenose dolphin and harbour porpoise monitoring was completed at five study sites in Cardigan Bay, West Wales. The data was collected by a team of volunteers, some of whom had already taken part in the project in previous years, but also working alongside volunteers new to the project. The study sites were located at Mwnt, Aberporth, New Quay Bird's Rock, New Quay Harbour and Borth.

Records from New Quay Harbour were collected and contributed to the database by the Wildlife Trust of South and West Wales Living Seas' staff and volunteers from the Cardigan Bay Marine Wildlife Centre (CBMWC).

Ceredigion County Council are very grateful for the staff and volunteer time dedicated to this research by the CBMWC without which this report would not be possible.

Site use by bottlenose dolphins

Watches of two hours each were scheduled with set start times of 09:00, 11:00, 13:00, 15:00, 17:00 and 19:00. At New Quay Harbour, The Wildlife Trust of South and West Wales Living Seas' staff and volunteers from the Cardigan Bay Marine Wildlife Centre carried out additional watches throughout the field season at 07:00. The two hour watches were divided into eight 15 minute intervals. At the beginning of each interval the start time and information on sighting conditions (general weather and visibility, wind direction and sea state) were recorded on a data sheet. This information was later used to extract a subset of observations made in good conditions (visibility at least 2 km, sea state 3 or less) for which sighting rates of bottlenose dolphins were calculated and comparisons made between study sites.

Dolphin and Porpoise Watch volunteers receive training at the start of each season to address any misconceptions and to update survey skills and data collection methodology. Volunteers are provided with a range of keys, guidance notes and a comprehensive photographic guide detailing cetacean behaviours that may be observed.

When marine mammals were present at the site their locations were marked on a map. Locations were estimated by eye within a grid of guidelines to landmarks. A group of bottlenose dolphins is considered to be animals in close proximity (within about ten body lengths of another animal) and behaving in a similar manner. Abbreviated codes were written against each individual animal or group location giving species name, group size, number of calves and behaviour at the beginning of the fifteen minute interval or when first seen.

From these systematic counts sighting rates for bottlenose dolphins were derived. Two indices were used to make comparisons between sites and with previous field seasons. These indices were:

- a) The proportion of two hour watches in which dolphins were recorded
- b) The average count of dolphins in a fifteen minute interval per two hour observation period.

For those watches in which dolphins were recorded at least once, three further indices were calculated:

- c) Group size: as a measure of the average group size or number of dolphins aggregated at each site, the mean of the highest count recorded in each watch was used. The total number of dolphins seen in each two hours was not estimated, as we cannot determine this from the data collected. The aim of the study is not to identify individual animals; therefore we are unable to establish whether the same animal/s moved through the site more than once in a watch.
- d) Occurrence of young bottlenose dolphins (juveniles or calves): bottlenose dolphins were recorded as calves if they were distinctly paler than the accompanying adult and approximately two-thirds of the adult length or less. Foetal folds may also still be visible.
- e) Site occupancy: to examine the amount of time that dolphins tended to occupy sites, the average number of fifteen minute intervals with bottlenose dolphins present per watch was calculated for watches in which dolphins were recorded at least once.

Encounters between bottlenose dolphins and water users

Additional information was recorded on the data sheet when a water user/s came within 300 metres of a group of bottlenose dolphins. This is classed as an 'encounter'.

Only the first encounter in each fifteen minute interval was recorded. This reduced the likelihood of bias towards particular types of water users that observers may have considered to have a greater impact on dolphin behaviour.

For each 'encounter' the observer recorded the type of water user that was closest to a dolphin/group; the total number of water users within a 300 metre radius of an individual dolphin/group, and compliance/non-compliance with the Ceredigion Commercial Marine Code for wildlife trip boat operators, and the Ceredigion Marine Code for recreational water users; and all the dolphin behaviours that were observed.

Water users were considered to have complied with the Ceredigion Marine Codes if they either passed the animals at 'no-wake' speed, with no changes of course to approach (code Y1) or slowed down gradually and stopped (Y2). Four codes were used when water users did not comply and these were either because they were travelling too fast within 300 metres of dolphins (N1); they followed a changes of course to approach or follow dolphins (N2); they attempted to touch, feed or swim with dolphins (N3), or they were clearly exceeding 8 knots within a buoyed, low speed zone at New Quay (N4). A code (R) was used when the boat involved was a vessel permitted under licence from Natural Resources Wales to approach bottlenose dolphins for research purposes. These vessels carry a flag that they must fly when they are invoking their licence.

We then examined whether compliance or non-compliance with the Ceredigion Marine Codes affected the dolphins' behaviour and how the dolphins responded to encounters with water users. Observers recorded dolphin behaviour for each fifteen minute interval throughout the two hour observation period and the dolphins' behavioural responses during encounters.

Results

Observer effort

During 2024 a total of 1275 observation periods (watches) were carried out between March and October (Table 1). Since the first season's field work in 1994 a total of 21,612 watches has been completed.

When the project began observations were carried out at three sites; Aberporth, New Quay Bird's Rock and Ynys Lochtyn. In recent years however, watches at Ynys Lochtyn have not taken place every year. During 2017 some watches were completed at Ynys Lochtyn by the Cardigan Bay Special Area of Conservation officer; due to lack of capacity this was not possible in 2018, 2023 or 2024.

Borth has also been added as a new site. Mwnt has been included since 1998; New Quay Harbour and Aberystwyth were added to the site list in 2004. No data was collected at Aberystwyth in 2024.

The New Quay Harbour data is contributed to the database by The Wildlife Trust of South and West Wales. This data is collected by Living Seas' staff and volunteers based at the Cardigan Bay Marine Wildlife Centre, following the same survey protocols but surveys are conducted over the full calendar year.

Table 1: Observation period (watch) totals in the period 1st March – 31st October 2024

	All sites	Mwnt	Aberporth	New Quay Bird's Rock	New Quay Harbour	Borth
No of watches	1275	39	36	67	1120	13
Hours of effort	2550	78	72	134	2240	26

Survey conditions

Between 1st March and the 31st October 2024, 1201 watches, 2402 hours of effort were completed in good conditions for observing marine mammals (Table 2). Watches conducted when conditions were not suitable were removed from the dataset. Only watches where data was available for the full two hour survey (eight successive fifteen minute intervals) conducted in Beaufort sea state 3 or less and where visibility was greater than 2 km were used for further analysis (Figures 1 & 2).

Table 2: Number of watches conducted in good conditions (used for further analysis)

	All sites	Mwnt	Aberporth	New Quay Bird's Rock	New Quay Harbour	Borth
Number of watches in good conditions	1201	39	36	67	1046	13
Hours of effort in good conditions	2402	78	72	134	2092	26

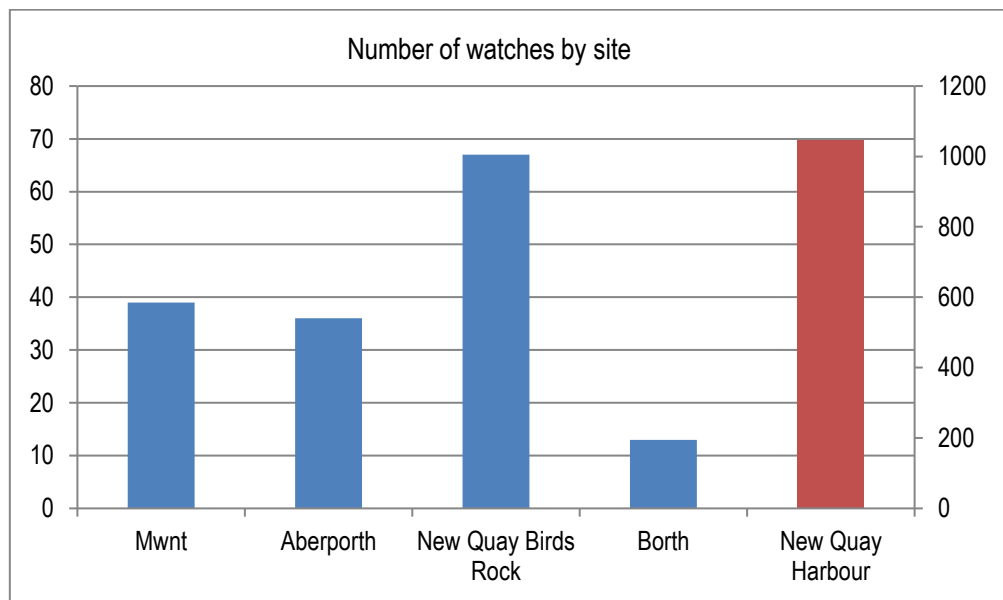


Figure 1: Number of watches conducted in good weather at Dolphin Watch monitoring sites

N.B. New Quay Harbour watches are conducted every day throughout the season from 7am to 7pm by Living Seas' staff and volunteers based at the CBMWC. The number of watches at this site is therefore much higher.

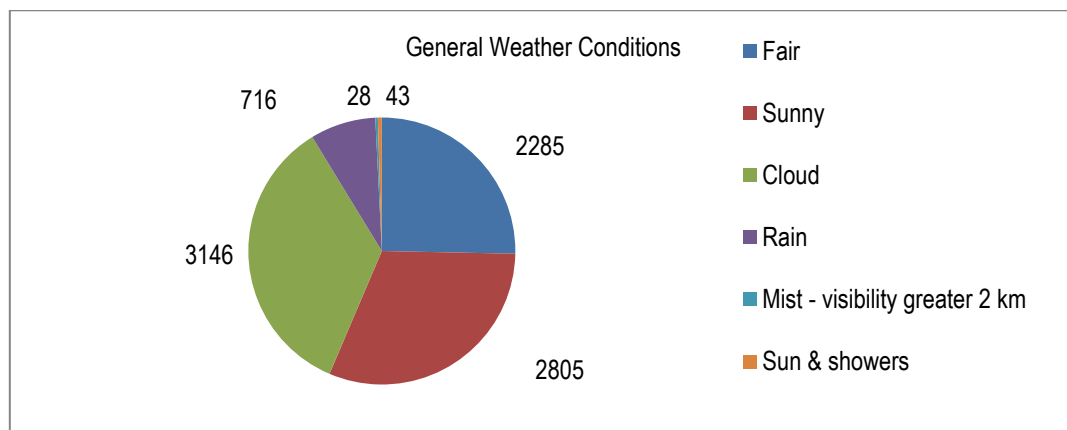


Figure 2: Weather conditions (number of intervals)

The median sea state across all sites was sea state 2 (wavelets, glassy crests that do not break). The median sea state for individual sites was sea state 1 (calm, rippled surface) for Aberporth and Borth. The median sea state for Mwnt and New Quay Harbour was sea state 2 (wavelets, glassy crests that do not break). The median sea state for New Quay Bird's Rock was sea state 3 (small waves with occasional whitecaps).

Sightings rates

Sightings rates for bottlenose dolphins were calculated from 1201 watches. These were watches with eight intervals recorded in good conditions (sea state 3 or less and visibility >2km) between the beginning of March and the end of October 2024.

Table 3: Percentage of two hour watches at each site with dolphin sightings

Year	Mwnt	Aberporth	New Quay Bird's Rock	New Quay Harbour	Borth
2024	67%	8%	29%	57%	8%

Mwnt had the highest sightings rate at 67%.

All other sites have a decrease in sightings.

New Quay Harbour had a sightings rate of 57%, a 10% decrease from the 67% sightings rate of 2023 and 2022.

Aberporth had remained constant at 23% in 2016 and 2017, with an increase to 33% in 2018, dropping to 17% in 2019; and dropping further in 2021 to 14%. In 2022 there was a significant increase in the sightings rate to 43%. The 2023 sightings rate at Aberporth was just 10%, and in 2024 just 8%.

The New Quay Bird's Rock sightings rate dropped in 2023 to 37% from the 49% rate in 2022; dropping still further in 2024 to just 29%.

There was no available data for Aberystwyth for 2024.

Borth was a new site for 2019, with a sightings rate of 13%, increasing in 2021 to 24%, and increasing again to 40% in 2022.¹ In 2023 the rate dropped to 22%, dropping still further in 2024 to just 8%.

¹ (Figures for 2016 were taken from Heath, M and Vaughan, A (2018) 'Dolphin Watch: Bottlenose dolphins and boat traffic on the Ceredigion coast, West Wales 2016'. Figures for 2017 were taken from Heath, M and Vaughan, A (2019) 'Dolphin Watch: Bottlenose dolphins and boat traffic on the Ceredigion coast, West Wales 2017'. Figures for 2018 were taken from Heath, M and Vaughan, A (2022) 'Dolphin Watch: Bottlenose dolphins and boat traffic on the Ceredigion coast, West Wales 2018'. Figures for 2019 were taken from Heath, M and Vaughan, A (2023) 'Dolphin Watch: Bottlenose dolphins and boat traffic on the Ceredigion coast, West Wales 2019'. Figures for 2021 were taken from Heath, M and Hughes, I (2025) 'Dolphin Watch: Bottlenose dolphins and boat traffic on the Ceredigion coast, West Wales 2021'. Figures for 2022 were taken from Heath, M and Hughes, I (2026) 'Dolphin Watch: Bottlenose dolphins and boat traffic on the Ceredigion coast, West Wales 2022'. Figures for 2023 were taken from Heath, M and Hughes, I (2026) 'Dolphin and Porpoise Watch: Bottlenose dolphins and water user traffic on the Ceredigion coast, 2023'.

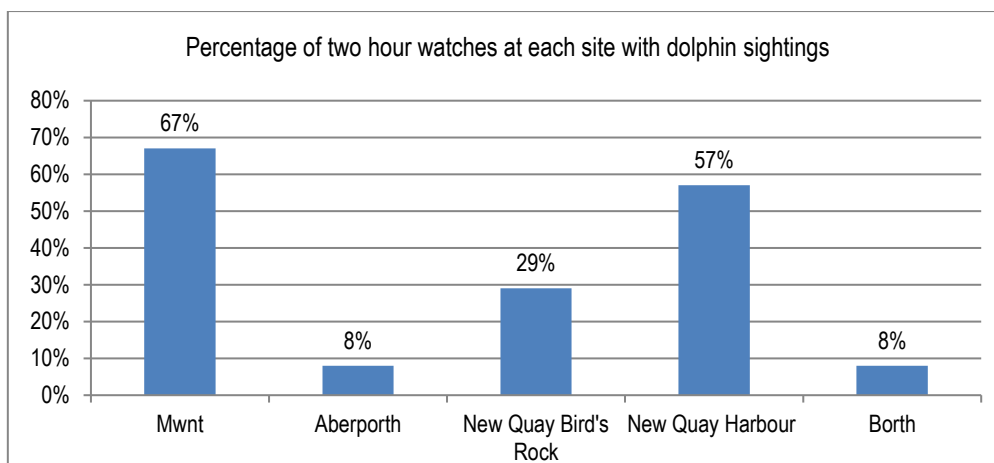


Figure 3: Sightings rates - percentage of two hour watches in which dolphins were recorded

Table 4: Mean average number of dolphins observed in a fifteen minute interval where dolphins were sighted

Year	Mwnt	Aberporth	New Quay Bird's Rock	New Quay Harbour	Aberystwyth	Borth
2024	5	1	3.5	3	No data	1
2023	4.5	1	4	2.3	No data	2.1
2022	4.6	3	4.6	2.3	2.5	2.4
2021	4.3	3	3.8	3.75	2.2	2.4
2019	3.7	2.7	3.7	3.3	2.1	2

Mwnt recorded the highest average number of dolphins in 2024 (Table 4 & Figure 4).

New Quay Harbour has remained constant since 2019 at an average of 2 to 3.

New Quay Bird's Rock has fluctuated since 2019 between 3 and 4.

Aberporth has dropped to just 1, after staying constant with a mean average of between 2.5 and 3 for the site in recent years.

Borth also dropped to an average of just 1 in 2024, after an average of between 2 and 2.4 since watches began here in 2019 up until 2023.

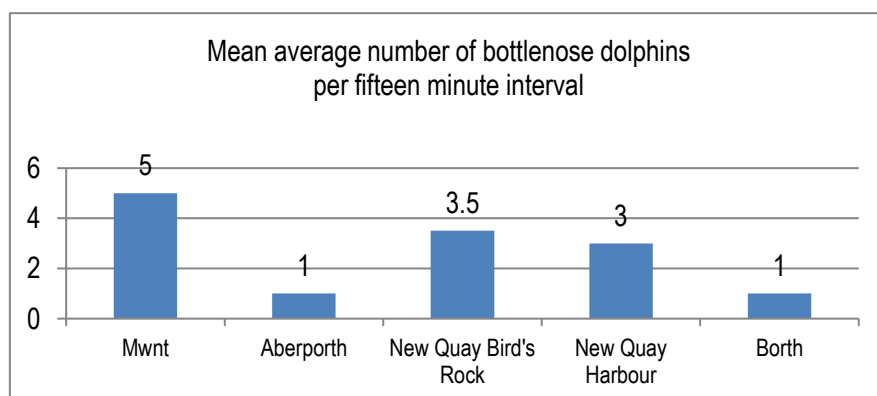


Figure 4: Mean average number of dolphins observed in a fifteen minute interval where dolphins were sighted

Group size

The mean average of the highest group size of dolphins recorded per interval in each two hour watch when sightings occurred was used as a measure of group size (Table 5 & Figure 5).

The greatest mean group size in 2024 occurred at Mwnt. Mean group size at Mwnt has been increasing steadily over the last five years. In contrast, mean group size at New Quay Harbour has been dropping over the last 5 years.

Table 5: Mean average of the highest group size of bottlenose dolphins recorded in each two hour watch

Year	Mwnt	Aberporth	New Quay Bird's Rock	New Quay Harbour	Aberystwyth	Borth
2024	5	1	3	2	No data	1
2023	4.6	1	4	3.4	No data	1.8
2022	4.4	2.9	3.9	3.4	2.6	2.3
2021	4.1	3	3.9	3.6	2.3	2.3
2019	3.2	3	4	4.2	1.9	2

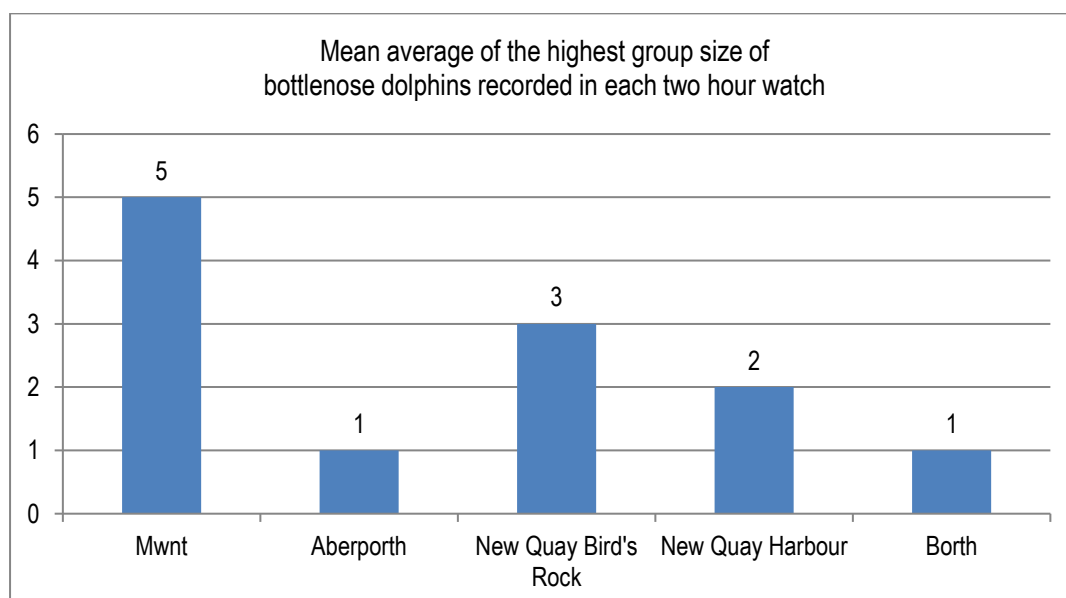


Figure 5: Mean average of the highest group size of bottlenose dolphins recorded in each two hour watch

Maximum recorded group size at each site

The maximum dolphin group size observed at each site was also recorded (Table 6 & Figure 6). The largest group sizes were observed at New Quay Harbour (12 animals) Mwnt (10 animals) and New Quay Bird's Rock (9 animals). The Mwnt, New Quay Bird's Rock and New Quay Harbour sites show consistently larger groups of animals in all years since group size was first included in the 2008 report.

Table 6: Maximum recorded group size at each site

Year	Mwnt	Aberporth	New Quay Bird's Rock	New Quay Harbour	Borth
2023	15	2	6	12	6

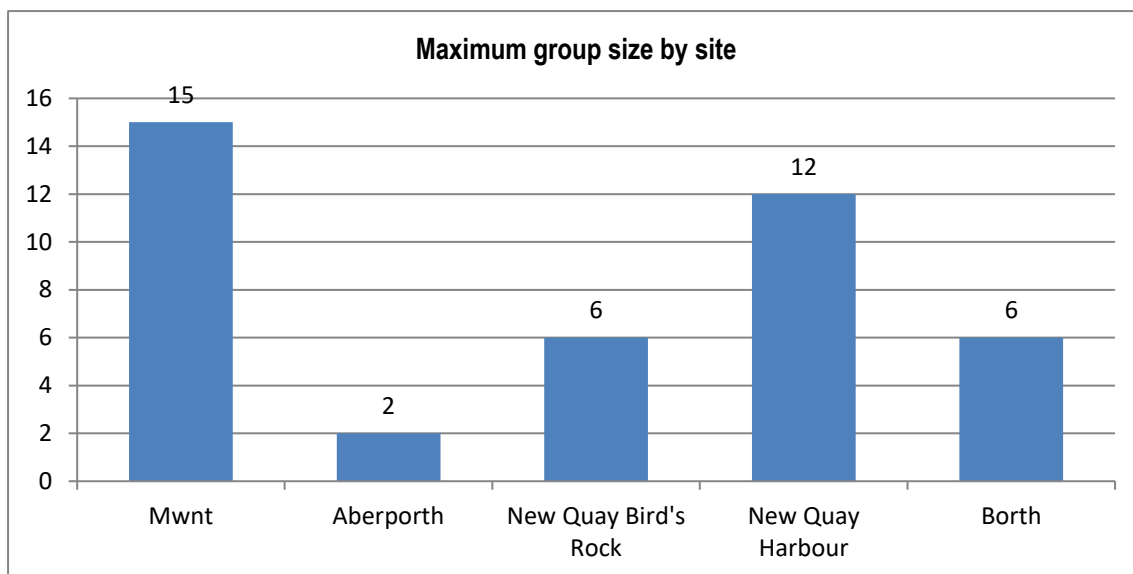


Figure 6: Maximum group size of bottlenose dolphins by site

Sightings of young bottlenose dolphins

Table 7: Young dolphin sightings (percentage of watches when dolphins present with young animals) at sites where more than five watches took place

Year	Mwnt	Aberporth	New Quay Bird's Rock	New Quay Harbour	Aberystwyth	Borth
2024	31%	67%	16%	64%	No data	0
2023	55%	0%	37%	66%	No data	20%
2022	29%	24%	37%	66%	23%	18%
2021	31%	0%	19%	66%	39%	30%
2019	15%	20%	23%	61%	14%	67%

Site occupancy

Site occupancy is defined as the amount of time that bottlenose dolphins were present at each site. It is measured as the mean average number of fifteen minute intervals that dolphins were recorded per two hour watch; i.e. when dolphins were present, how long did they stay.

Table 8: Site occupancy (mean number of fifteen minute intervals per watch when dolphins were present) at sites where more than five watches took place

Year	Mwnt	Aberporth	New Quay Bird's Rock	New Quay Harbour	Aberystwyth	Borth
2024	4.8	1	3.5	4.79	No data	1
2023	4.5	2.5	4	5	No data	3.6
2022	4.6	3.4	3.6	5	3.6	3

2021	4.1	1	4.4	5.2	2.4	3
2019	3.2	3.2	3.7	5	3.7	7

Water user encounters

Levels of water user traffic by site

Water user traffic was monitored by tally counts of water-craft over each two hour observation period. A total tally of 14,543 in 2024.

New Quay Harbour was the busiest site for water user traffic followed by New Quay Bird's Rock, then Aberporth, Borth was fourth, with the lowest water user count at Mwnt (Table 9 & Figure 7).

Table 9: Mean water user counts per two hour watch 2024

	Mwnt	Aberporth	New Quay Birds Rock	New Quay Harbour	Borth
2024	0.6	4	6.5	12.4	2.8

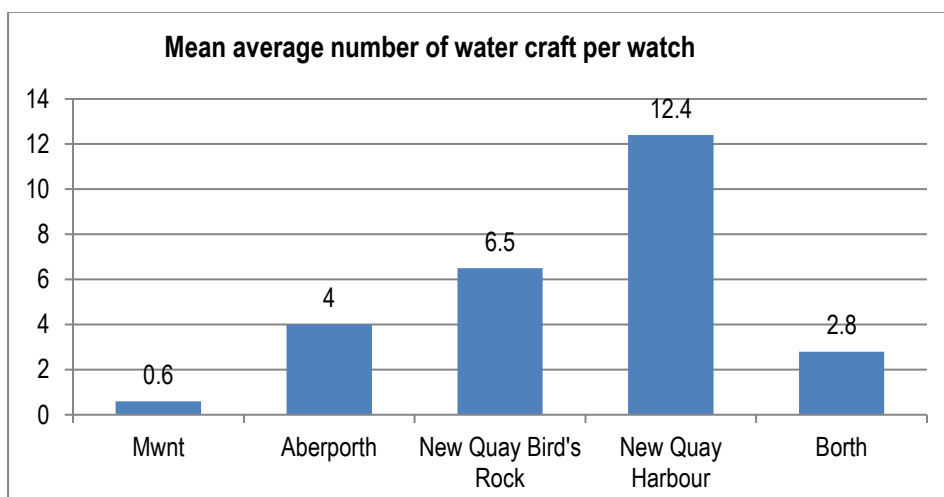


Figure 7: Mean average water user counts per two hour watch for each site

The most frequently recorded water user types in New Quay Harbour in 2024 were visitor passenger boats with 4760 recorded. Canoes, kayaks and SUPs were the second highest recorded at 3890. The next highest category was motor boats at 2186, sail boats at 1218 and speed boats/RIBs at 1131.

New Quay Bird's Rock, had the second highest water user count; where visitor passenger boats were the most frequent, with 383 recorded. Counts of all other water user types were very low; the second highest water user count was speed boats at just 13. Therefore the number of visitor passenger boats at Bird's Rock is significantly higher than any other type of water user.

Table 10: Total count of different water user types on each site in 2024 in good weather watches

Site	motor boat	speed boat/RIB	sail boat	commercial fishing boat	Visitor passenger boat	Canoe/ kayak/ sup	jet-ski	RNLI	Research
Mwnt	1	0	2	4	2	15	0	0	0
Aberporth	7	23	32	7	2	73	0	0	0
New Quay Bird's Rock	12	13	4	10	383	12	2	0	0
New Quay Harbour	2186	1131	1228	584	4760	3890	42	41	13
Borth	19	2	2	4	0	10	0	0	0

Table 11: Mean average counts of different water user types for each site by two hour watch in 2024

Site	motor boat	speed boat/RIB	sail boat	commercial fishing boat	visitor passenger boat	Canoe kayak/SUP	jet-ski	Other research/ RNLI
Mwnt	0.3	0	0.05	0.1	0.05	0.39	0	0
Aberporth	0.2	0.6	0.82	0.18	0.5	2.1	0	0
New Quay Bird's Rock	0.8	0.34	0.06	0.1	5.7	0.2	0	0
New Quay Harbour	2.2	1.1	1.2	0.6	4.8	3.9	0.04	0.01
Borth	1.5	0.2	0.2	0.3	0	0	0	0

New Quay Harbour

Due to the high volume of water users in the New Quay Harbour area, a factor unique to this site; water user counts per watch time and dolphin occupancy per watch time were also investigated to examine whether there is a correlation between the number of water users and site use by bottlenose dolphins.

The watch between the hours of 09:00 – 1100 and 1100 – 1300 has the greatest average number of water users recorded per watch at 17 for both watch periods.

The watches from 17:00 – 19:00 hours recorded the highest percentage of dolphins at 65%, this period had a water user count with a mean average of 13.

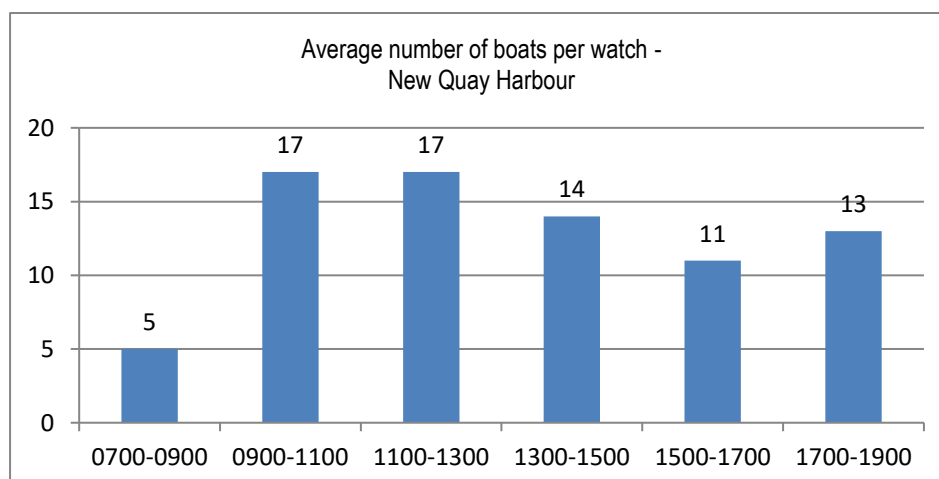


Figure 7: Average number of water users recorded by time of watch at New Quay Harbour 2024

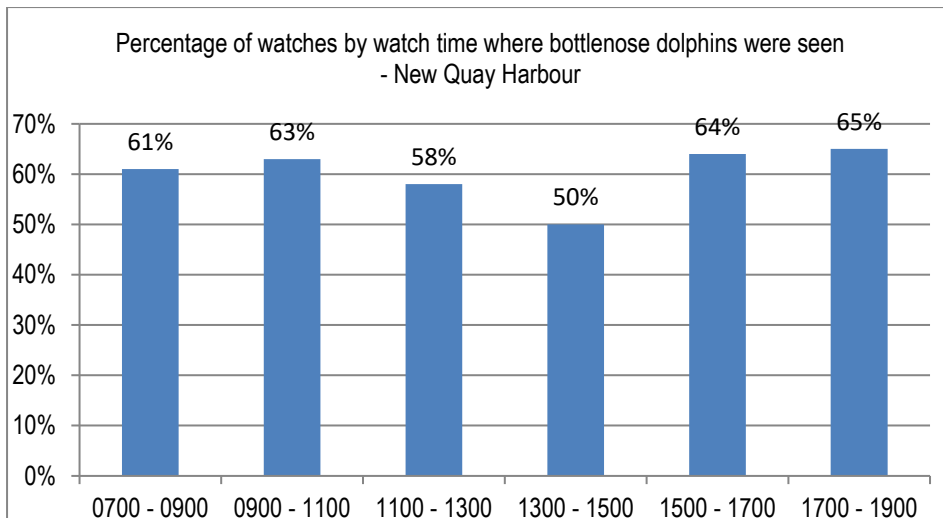


Figure 8: Percentage of watches by time of day where dolphins were seen at New Quay Harbour 2024

The graphs below show the average number of water-craft by watch for the three most frequent types of water-craft recorded from the New Quay Harbour monitoring site.

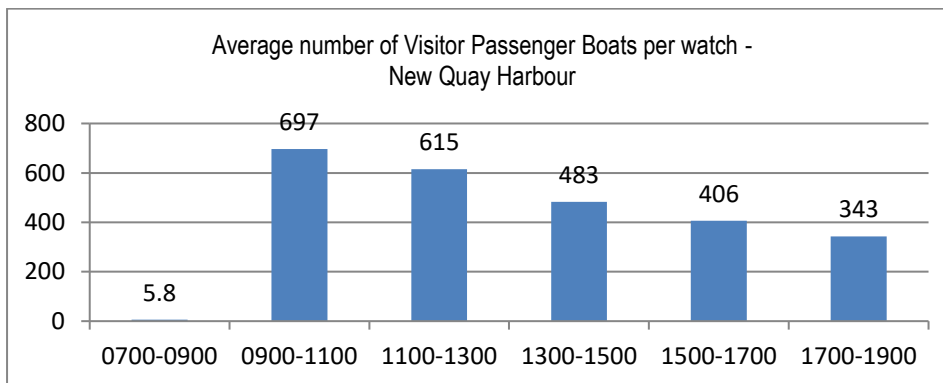


Figure 9: Average number of Visitor Passenger Boats recorded per watch at New Quay Harbour 2024

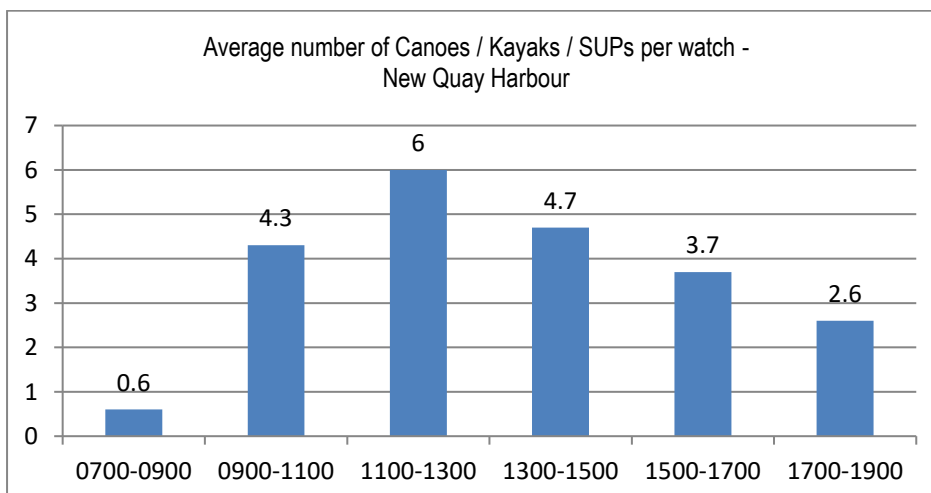


Figure 10: Average number of Canoes / Kayaks / SUPs per watch at New Quay Harbour 2024

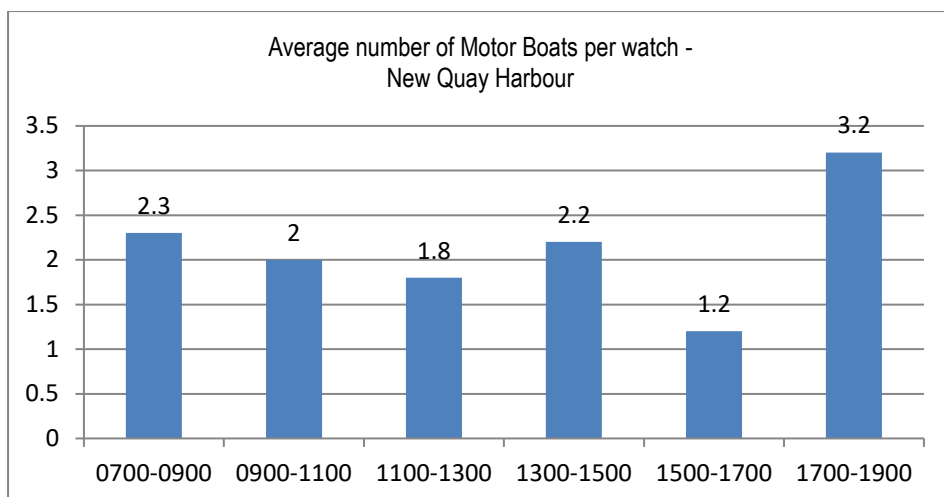


Figure 11: Average number of Motor Boats recorded per watch at New Quay Harbour 2024

Encounters between dolphins and water users

The protocol followed during a Dolphin Watch survey defines an encounter as occurring when any watercraft travels within 300m of an individual dolphin or a group of dolphins. A total of 3261 water-craft users were within 300 meters of dolphins during an encounter in 2024. Because the current protocol only records the behaviour of the first watercraft in an encounter during each Observation Period the total number of encounters recorded between bottlenose dolphins and watercraft in 2024 was 1745. The highest observed encounter rates were at New Quay Harbour; Bird's Rock had the second highest encounter rate, followed by Mwnt. Encounters with visitor passenger boats were the most frequently recorded.

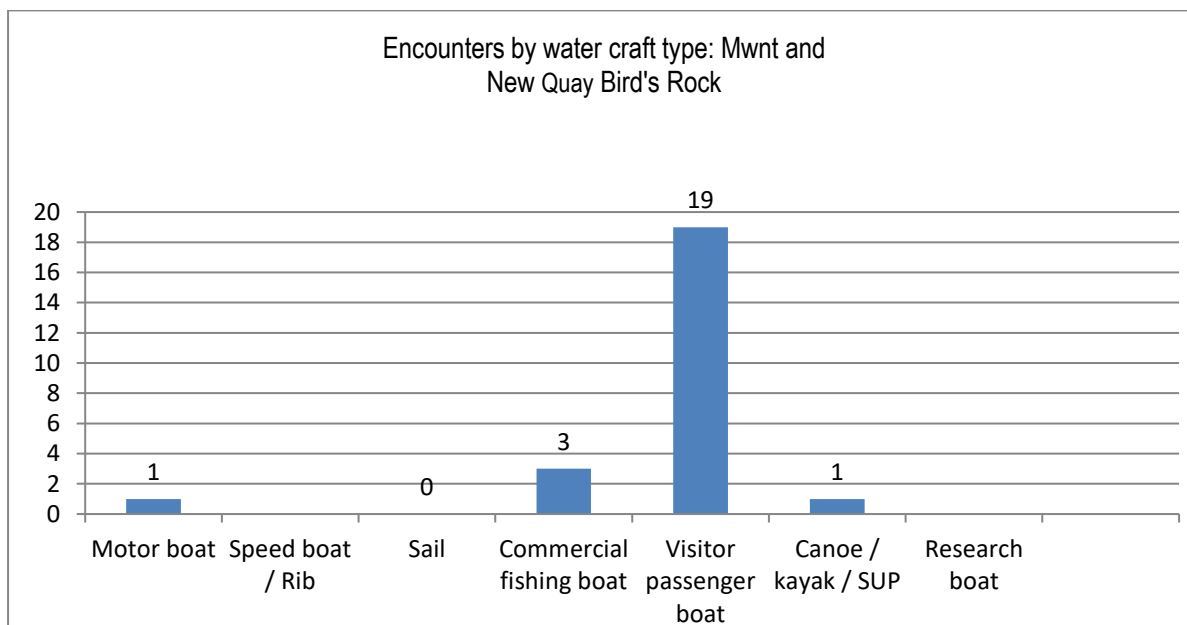


Figure 12: Encounters by water user type: Mwnt and New Quay Bird's Rock, 2024

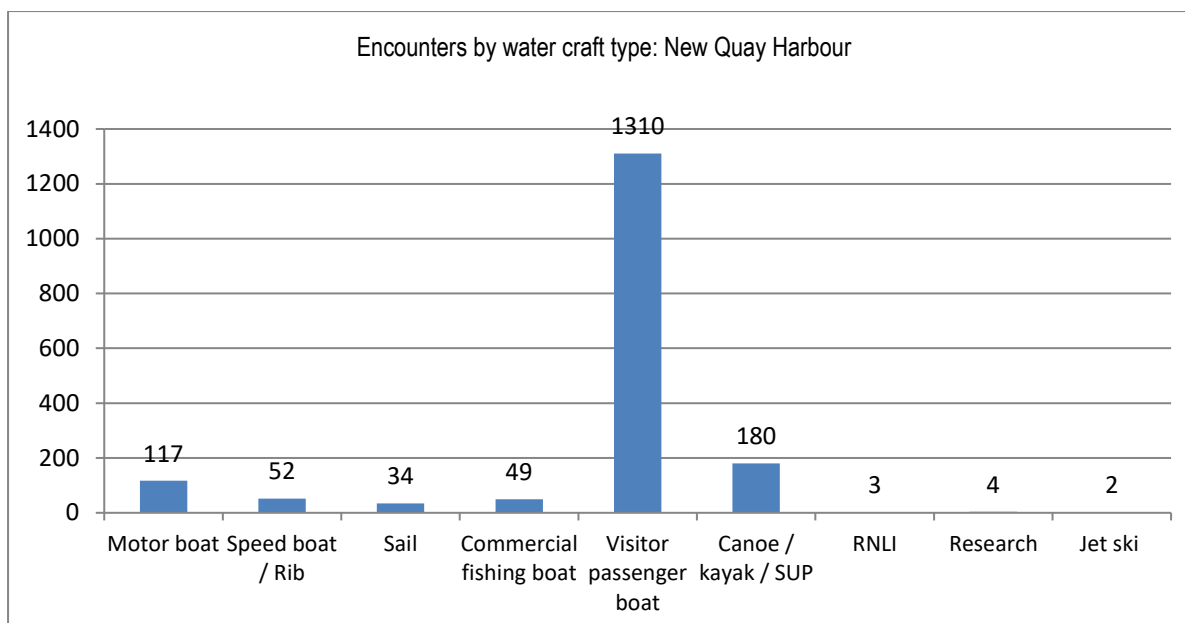


Figure 13: Encounters by water user type: New Quay Harbour 2024

Compliance with the Cardigan Bay Marine Codes by water users during encounters with dolphins 2024

There were 1745 encounters recorded between water users and dolphins during the 2024 survey period. In 1499 (88%) of the encounters the observer recorded that the water user followed the relevant Marine Code; these Marine Codes are the guidelines for recreational water users and for commercial passenger boats. There were 246 (12%) of encounters in which water users did not follow the appropriate Marine Code (Table 12).

The rate of compliance with the Cardigan Bay Marine Codes varied by location; New Quay Bird's Rock had the highest rate of compliance at 100%. New Quay Harbour had a compliance rate of 86% while Mwnt had the lowest compliance rate at 73%. (Table 12 and Figure 14).

Table 12: Percentage of compliance/non-compliance with the Cardigan Bay Marine Codes during dolphin encounters 2024

Site	Total number of water user encounters	Number of water user encounters following the Marine Codes	Percentage compliance with the Marine Codes	Number of water user encounters not following the Marine Codes	Percentage non-compliance with Marine Codes
Mwnt	11	8	73%	3	27%
New Quay Bird's Rock	13	13	100%	0	0%
New Quay Harbour	1721	1478	88%	243	12%
All sites	1745	1499	86%	246	14%

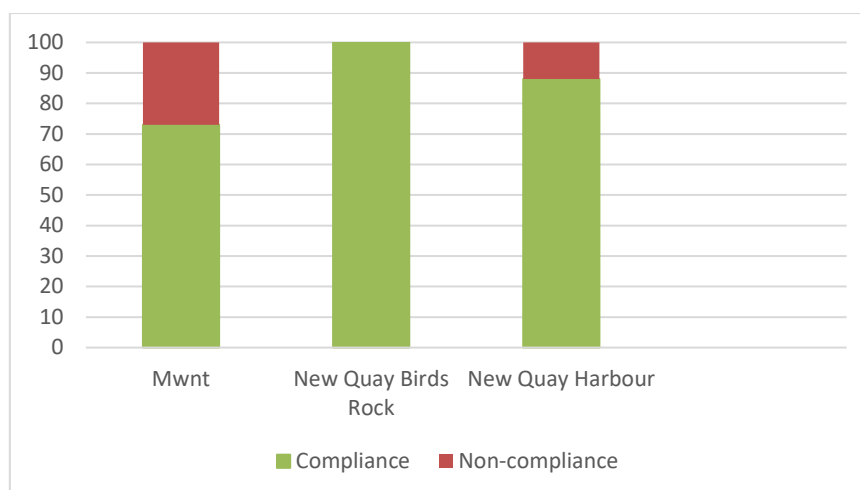


Figure 14: Percentage of compliance/non-compliance with the Cardigan Bay Marine Codes during dolphin encounters 2024

Proportions of different types of non-compliance with the Cardigan Bay Marine Codes 2024

Non-compliance with the Cardigan Bay Marine Codes involved water users manoeuvring to either approach or follow the dolphins (74%) or vessels travelling too fast within 300 metres of a group of dolphins (26%).

Table 13: Relative proportions of types of non-compliance with the Cardigan Bay Marine Codes 2024

Water user activity (when not complying with the Cardigan Bay Marine Codes)	Number of encounters	Percentage of non-compliance
N1: Too fast, wake speed within 300m of dolphins	63	26%
N2: Manoeuvring or approaching dolphins	183	74%

The incidence of non-compliance for different water users 2024

Canoes/ kayaks and SUPs had the highest rate of non-compliance: in 34% of all encounters with a canoe/kayak or Sup the water user did not follow the Cardigan Bay Marine Codes. (Table 14).

Table 14: Non-compliance of different types of water user 2024

Water user type	Number of non-compliant water users by type	Total number of encounters by type	Percentage of non-compliance by type
Speedboat (rib)	15	52	29%
Motor boat	27	118	23%
Canoe/kayak/SUP	52	151	34%
Commercial fishing boat	11	52	21%
Sailing boat	6	34	17%
Visitor passenger boat	101	1329	10%
Jet-ski	0	2	0%
Other (RNLI & research)	0	7	0%

Total	212	1745	12%
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Percentage of non-compliance during encounters by water user type by site 2024

At Mwnt, two visitor passenger boats and a motor boat, were observed not complying with the Cardigan Bay Marine Codes. In general, the number of encounters recorded at this site were very low; 2024 was not a particularly good year weather or sea state wise, which may account for the lower numbers of water users recorded.

At New Quay Harbour, all water user types, except for jet skis, research and RNLI were recorded not following the Cardigan Bay Marine Codes.

		Motor boat	Speed boat (rib)	Commercial fishing boat	Sail boat	Visitor passenger boat	Canoe/kayak/SUP	Jet ski	research	(RNLI)	Total
Mwnt	Number of non-compliant water users by type	1	0	0	0	2	0	0	0	0	3
	Total number of encounters by type	1	0	3	0	6	1	0	0	0	11
	Percentage non-compliance by type	100%	0	0	0	33%	0	0	0	0	27%
New Quay Harbour	Number of non-compliant water users by type	30	13	12	6	129	53	0	0	0	243
	Total number of encounters by type	117	52	49	34	1310	150	2	3	4	1721
	Percentage of non-compliance by type	26%	25%	24%	18%	10%	35%	0	0	0	14%

Table 15: Percentage of non-compliance during encounters by water user type by site 2024

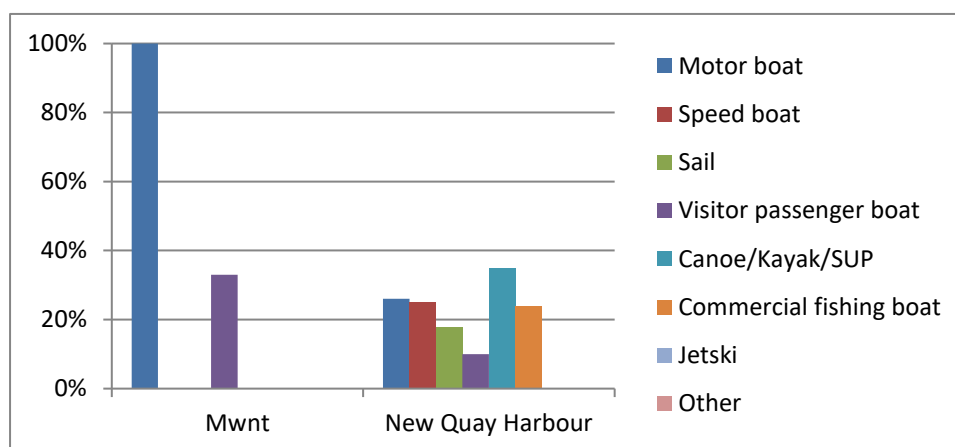


Figure 15: Percentage of non-compliance during encounters by water user type by site 2024

Effects of water user encounters on bottlenose dolphin behaviour

How dolphins responded to positive and negative encounters with water users (whether they followed the relevant Cardigan Bay Marine Code) was also examined. Observers recorded the different dolphin responses during encounters. In the analyses certain behaviours are grouped together; for example, 'heading away fast swimming' and 'heading away steadily' (HS or HF) are grouped together as a negative response (i.e. a change in dolphin behaviour to move away from a water user). Likewise, 'approaching' (AP) and 'bow-riding' (B) are grouped together as positive responses. 'Leaping' or 'begin leaping' (L or BL), 'tail-slap' (TS) and 'grouping' (GS or GF) are listed as separate categories but classed as negative responses.

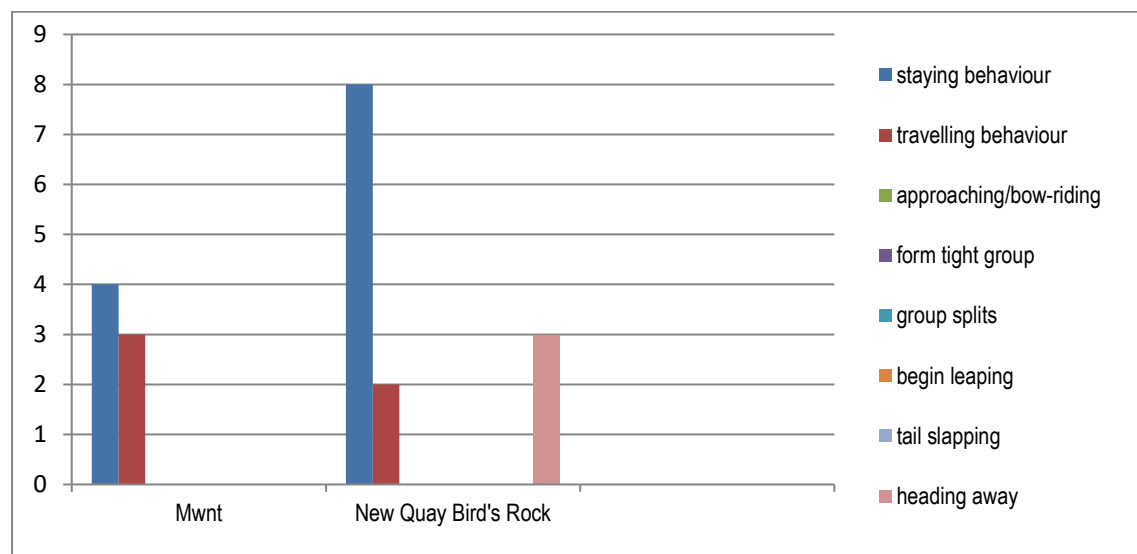


Figure 16: Dolphin behavioural responses to positive water user encounters (water users following the Cardigan Bay Marine Codes) at the Mwnt and New Quay Bird's Rock monitoring sites.



Figure 17: Dolphin behavioural responses to negative water user encounters (water users not following the Cardigan Bay Marine Codes) at the Mwnt and New Quay Bird's Rock monitoring sites.

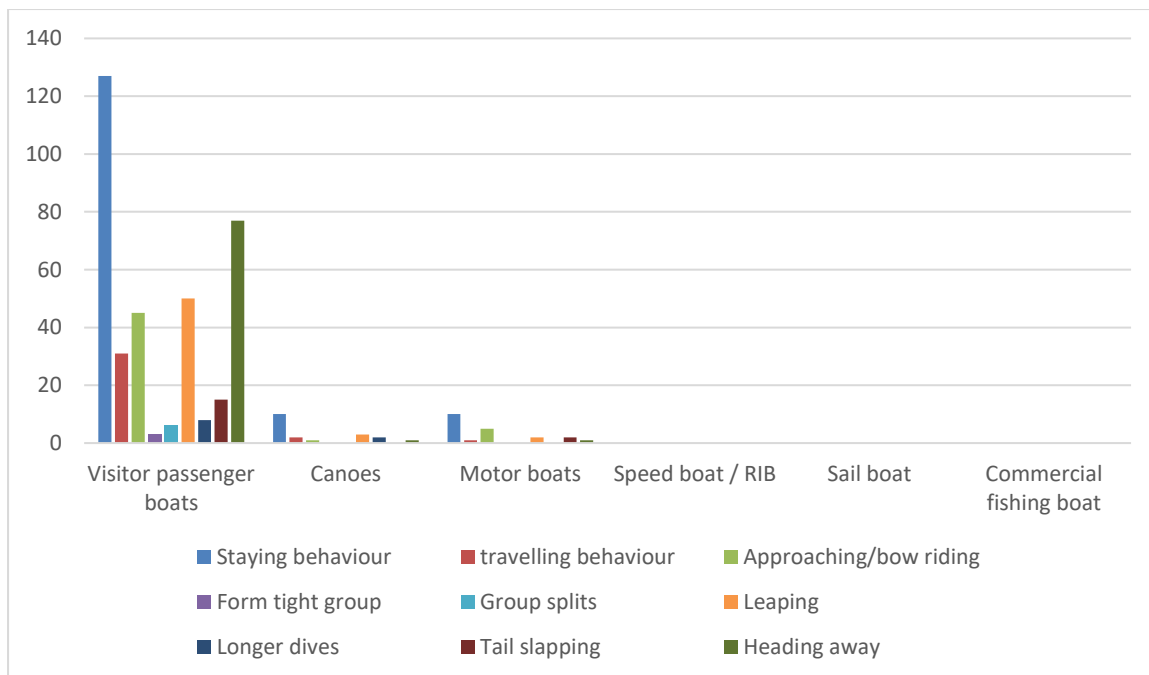


Figure 18: Dolphin behavioural responses to positive water user encounters (water users following the Cardigan Bay Marine Codes) at the New Quay harbour monitoring site by boat type

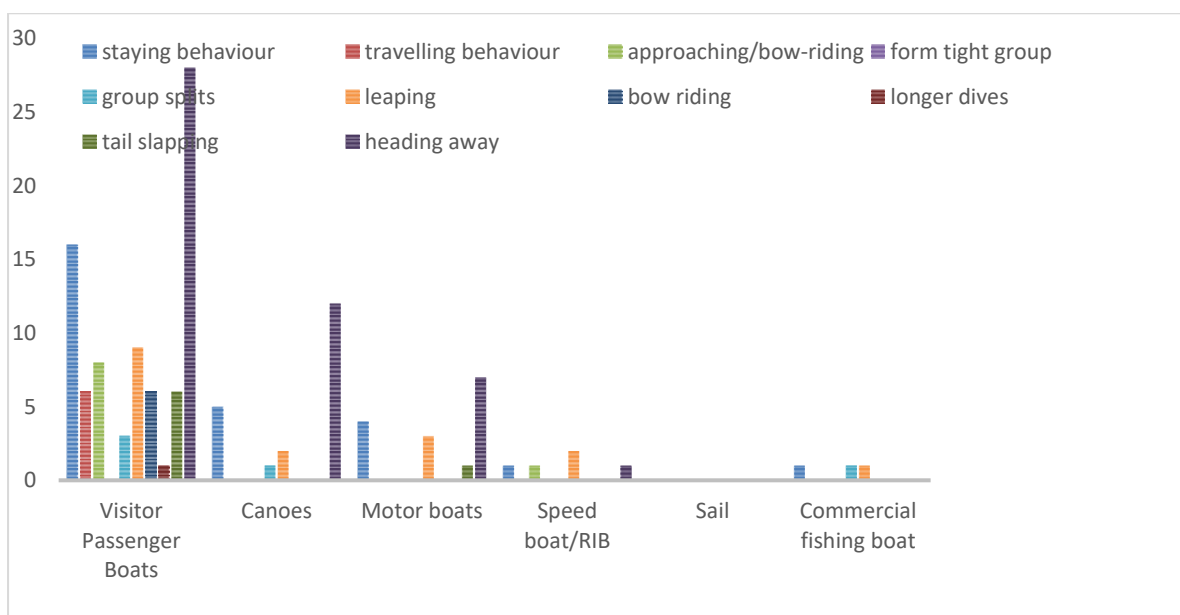


Figure 19: Dolphin behavioural responses to negative water user encounters (water users not following the Cardigan Bay Marine Codes) at the New Quay harbour monitoring site by boat type

All sites showed that when the Cardigan Bay Marine Codes were followed, 'staying' behaviour was the most frequently recorded response.

During encounters where the water user did not comply with the Cardigan Bay Marine Codes; at Mwnt 'heading away' was the only behaviour recorded. Bird's Rock had no negative encounters recorded in 2024.

At New Quay Harbour 'heading away' was the most frequently recorded behaviour when encountering any type of water user, when the Cardigan Bay Marine Code was not followed.

At New Quay Harbour there were significantly more encounters with Visitor passenger boats than any other type of water user.

Acknowledgements

Thank you to all the hundreds of people that have contributed to the Dolphin Watch data collection over the last twenty-nine years. More than 80 people contributed observations in 2024. Observers' names are listed below, with apologies for any errors or omissions.

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Appendix

Site use by harbour porpoise and Atlantic grey seal 2024

Atlantic grey seal

	Mwnt	Aberporth	New Quay Bird's Rock	New Quay Harbour	Borth
Number of seals recorded	4	3	90	206	0

Harbour porpoise

	Mwnt	Aberporth	New Quay Bird's Rock	New Quay Harbour	Borth
Number of harbour porpoise recorded	29	0	1	24	0