



J. Lamb



Relationships between presence of bottlenose dolphins, environmental variables and boat traffic; visual and acoustic surveys in New Quay Bay, Wales.

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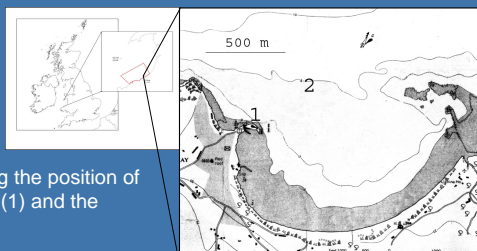
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Introduction

We investigated the use of New Quay Bay (fig. 1), by the resident bottlenose dolphins (*Tursiops truncatus*) by analyzing the relationships between dolphin presence/absence and variables such as time, tide, weather, sea state and boat traffic.

Figure 1: Location of the Cardigan Bay Special Area for Conservation (red) and New Quay Bay, showing the position of the visual surveys (1) and the T-POD (2)



Methods

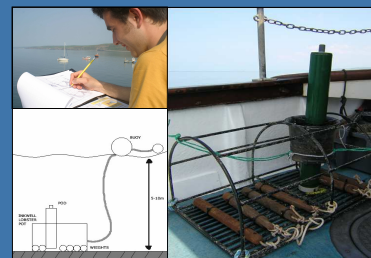
We conducted a land-based visual survey (497 hours from May 1st to August 7th 2004, fig. 2) and a T-POD acoustical survey (1077 hours from June 14th to August 7th 2004, fig. 2).

Figure 2.

Top: land-based visual survey

Right: T-POD prior to deployment

Bottom: method of deployment.



Results

• The presence of dolphins was affected by month (peak: June-August. Mann-Whitney U, $W = 779.5$, $P=0.0051$), time of day (Kruskal-Wallis, $H= 42.93$ $DF= 23$ $P= 0.007$) (fig. 3) and tidal cycle (Kruskal-Wallis, $H=24.54$ $D=11$ $P=0.011$) (fig 4), while weather and sea state had no significant influence on the animals.

•The presence of dolphins varied inversely with boat traffic (Kruskal-Wallis $H=298.74$, $DF=147$, $P<0.001$), with decreased evidence of dolphin presence in the afternoon, which was the peak time for boat activity (fig 3).

• The reaction of dolphins during boat interactions varied significantly. Most encounters resulted in the dolphin either changing its behaviour or disappearing from view (fig 5). Fast moving boats such as motor boats and speed boats appeared to cause greatest disturbance to the animals.

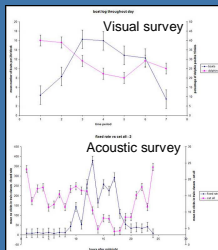


Figure 3 Dolphin presence and boat activity during the day.

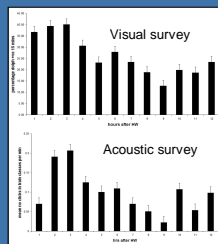


Figure 4 Dolphin presence during the tidal phase.

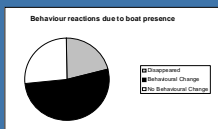


Figure 5 Observed reactions of dolphins after interactions with boats

Concluding remarks

- Visual and acoustic methods revealed broadly similar patterns.
- The level of boat traffic seemed to have an adverse effect on the presence of dolphins in the area.
- Despite this potential degree of boat disturbance, dolphin presence remained high during the months when boat traffic was highest.
- Precautionary measures such as codes of conduct for marine vessels and education campaigns may help to reduce disturbance experienced by bottlenose dolphins and other marine wildlife, due to increased boat activity in the area.
- Further study is necessary to determine any long term impacts of disturbance caused by boat traffic



Photo: S.Perez

Acknowledgements
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Photo: S.Perez