

Who's visiting New Quay, Ceredigion? – Temporal changes in site use by bottlenose dolphins (*Tursiops truncatus*) around New Quay harbour and headland



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Introduction

Cardigan Bay hosts a semi-resident population of bottlenose dolphins, one of only two major ones to be found within UK coastal waters. Due to their afforded protection under the EU Species and Habitats Directive, two Special Areas of Conservation (SACs) have been designated within Cardigan Bay. This study investigates the temporal changes in bottlenose dolphin presence in the New Quay harbour and headland area.

Methodology

Using land-based surveys from New Quay pier, dating back to 2006, and photo-identification surveys conducted from both land and boat surveys within 1.5 km of New Quay harbour and headland since 2001, the changes in bottlenose dolphin presence over time have been investigated. Two-hour long land-based watches were conducted daily between 7 am and 9 pm from April to October, weather and light permitting. Each two-hour watch was split into eight 15-minute scan intervals and only intervals carried out in sea state three or less were used for analysis. The photo-identification results were used to establish temporal changes in site usage for individual bottlenose dolphins.

Results

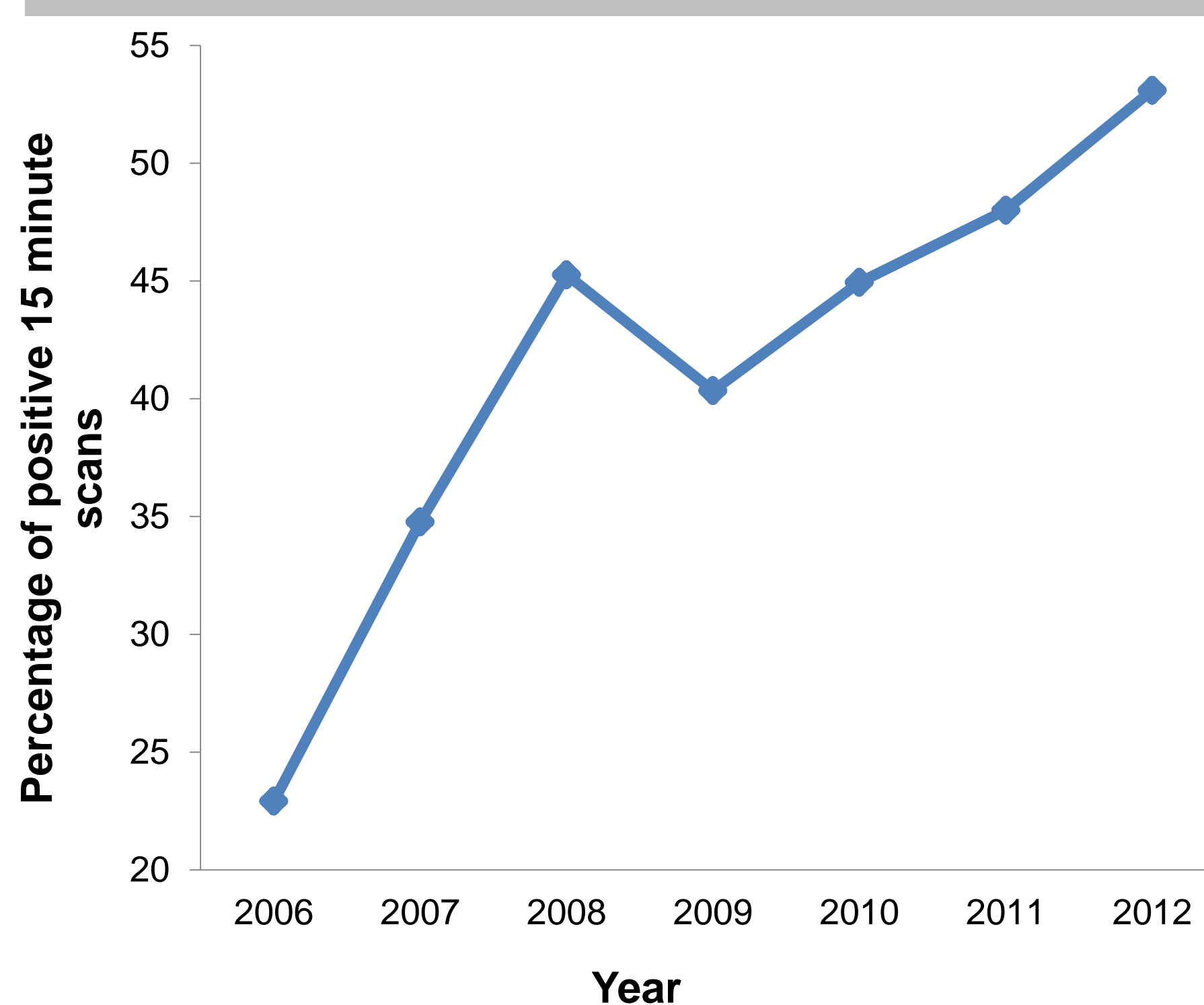


Figure 1: Percentage of positive (dolphin present) 15-minute scan intervals each year

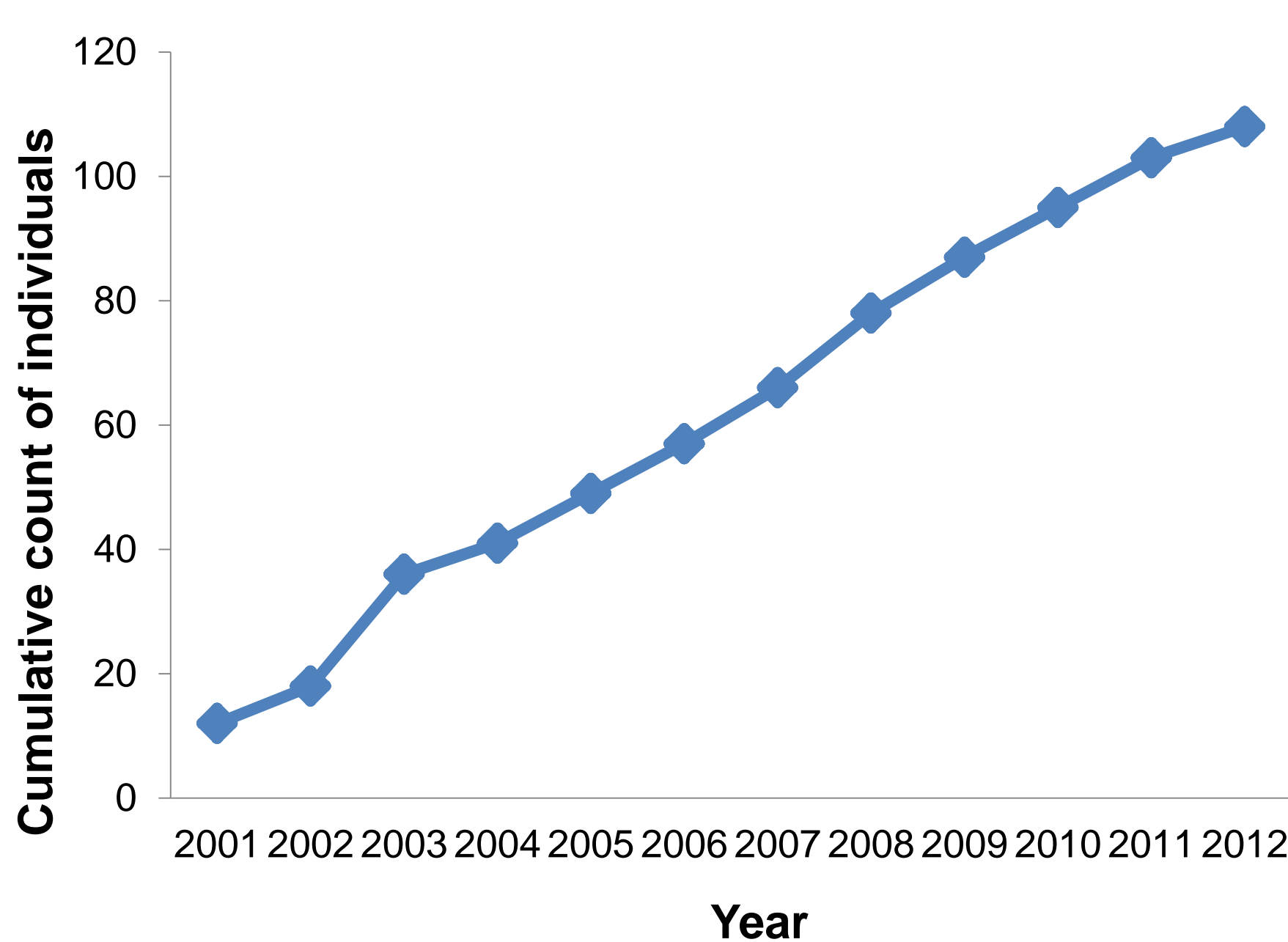


Figure 3: Discovery curve of marked individuals visiting the New Quay harbour and headland area from 2001-2012

The discovery curve of marked individuals (Figure 3) shows an annual steady increase of newly identified individuals from 12 in 2001 to 108 identified individuals in 2012.

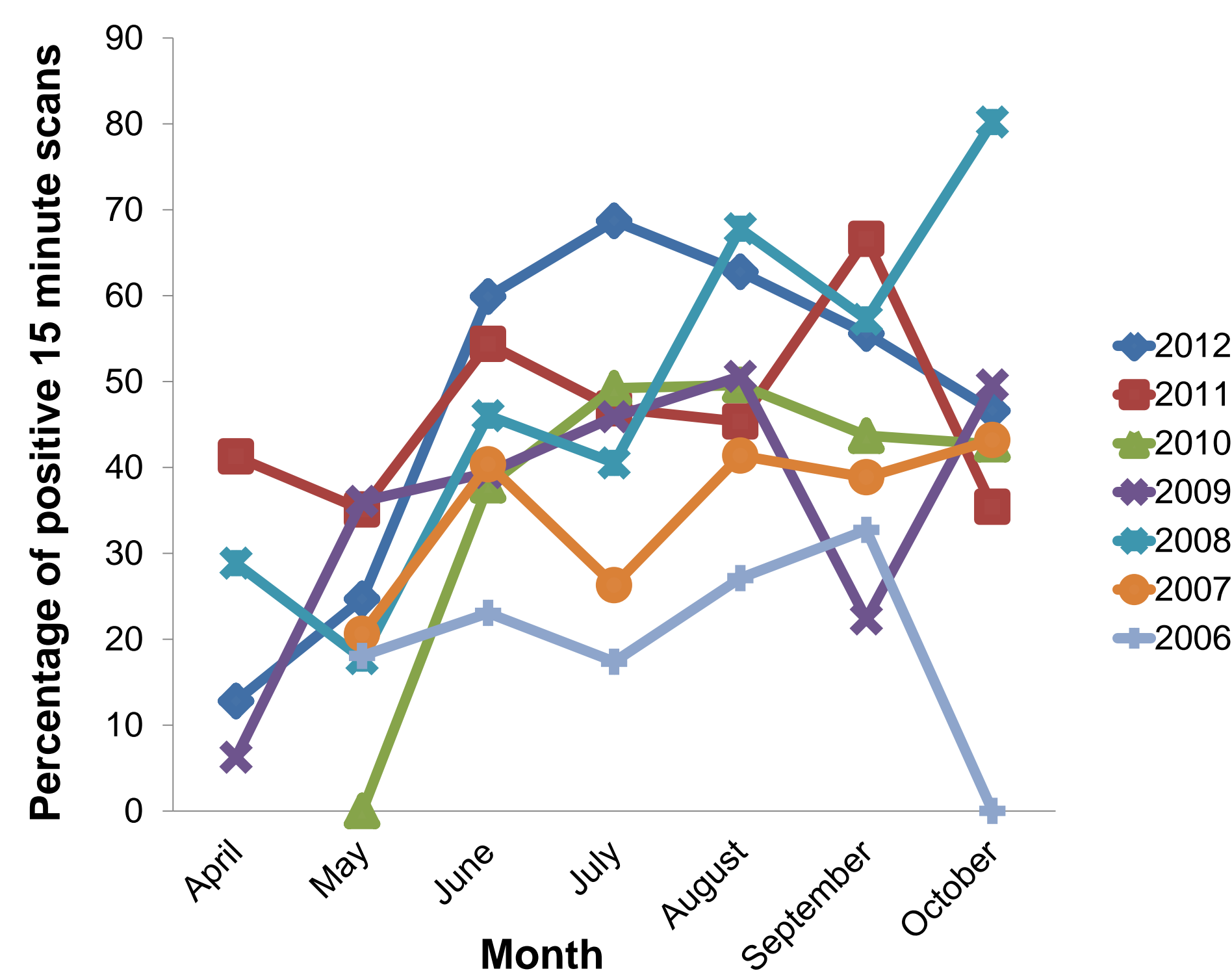


Figure 2: Percentage of positive (dolphin present) 15-minute scan intervals each month for each year

From 2001 to 2012, a total of 147 individuals have been identified using the New Quay harbour and headland area. ANOVA results indicate that both year ($F_{11,1225} = 3.42$, $p < 0.001$) and month ($F_{7,1225} = 2.65$, $p = 0.010$) were significant in determining which individuals were observed there. These results suggest that different individuals are identified using the New Quay harbour and headland area annually and monthly.

Individual 074-03W has been identified within the New Quay harbour and headland area multiple times, annually, since 2003 (Figure 4). By contrast, individual 060-01W has only been identified in the New Quay harbour and headland area twice in 2003, once in 2005, once in 2008, and twice in 2011 (Figure 5). The degree to which the site is used has also varied according to the individual.

There has been a general increase in dolphin presence within watches since 2006 (Figure 1), with ANOVA results indicating that both year ($F_{6,33} = 5.18$, $p = 0.001$) and month ($F_{6,33} = 5.57$, $p < 0.001$) have a significant influence. The percentage of positive 15-minute scans reached a peak in 2012 with dolphins present during 53% of scans (Figure 1). The month with the greatest percentage of positive 15-minute scans varied across the years, with peaks in either July, August, September, or for 2008, October (Figure 2).

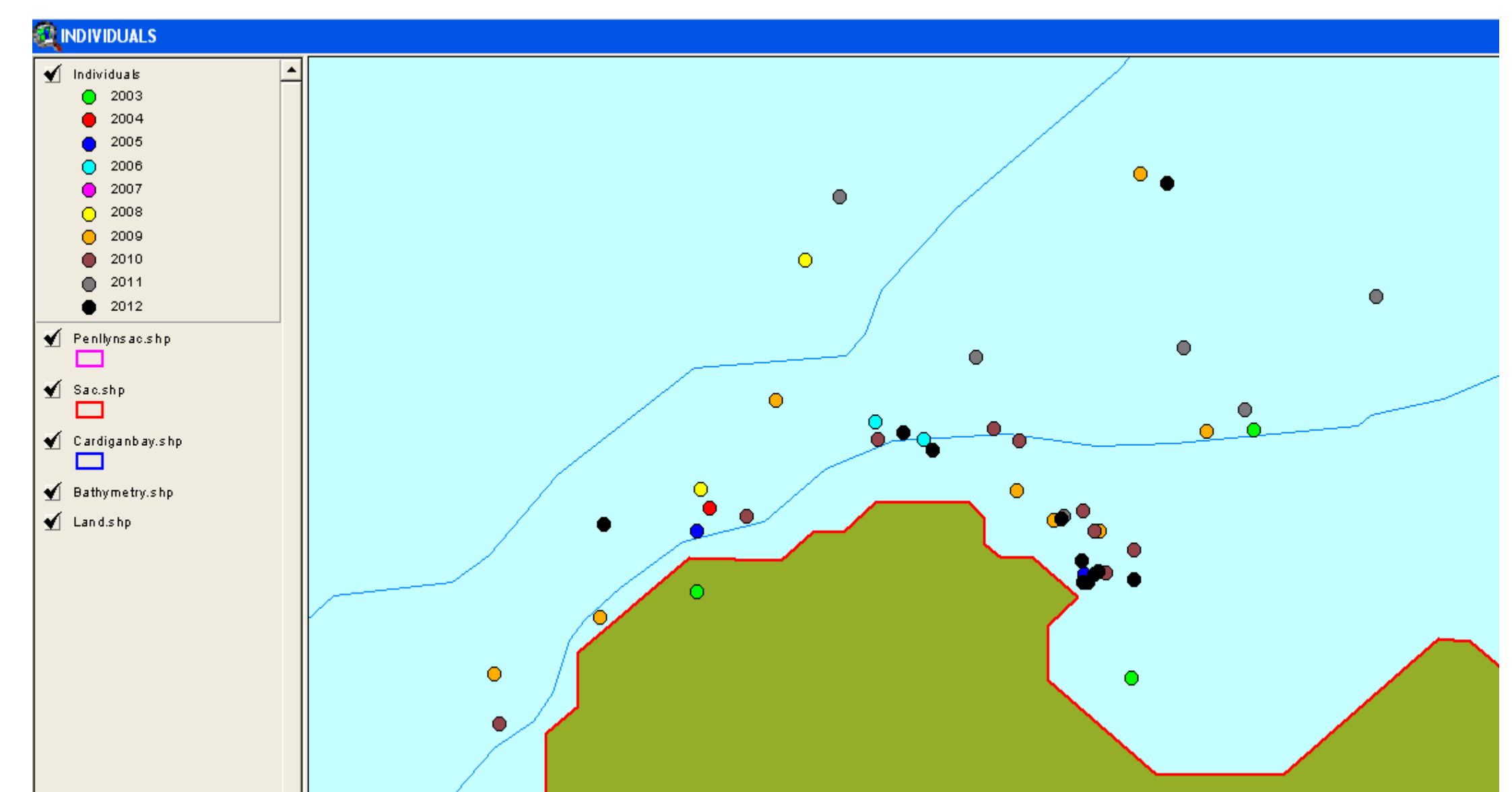


Figure 4: ArcView GIS screen shot of New Quay harbour and headland displaying the annual presence of individual 074-03W

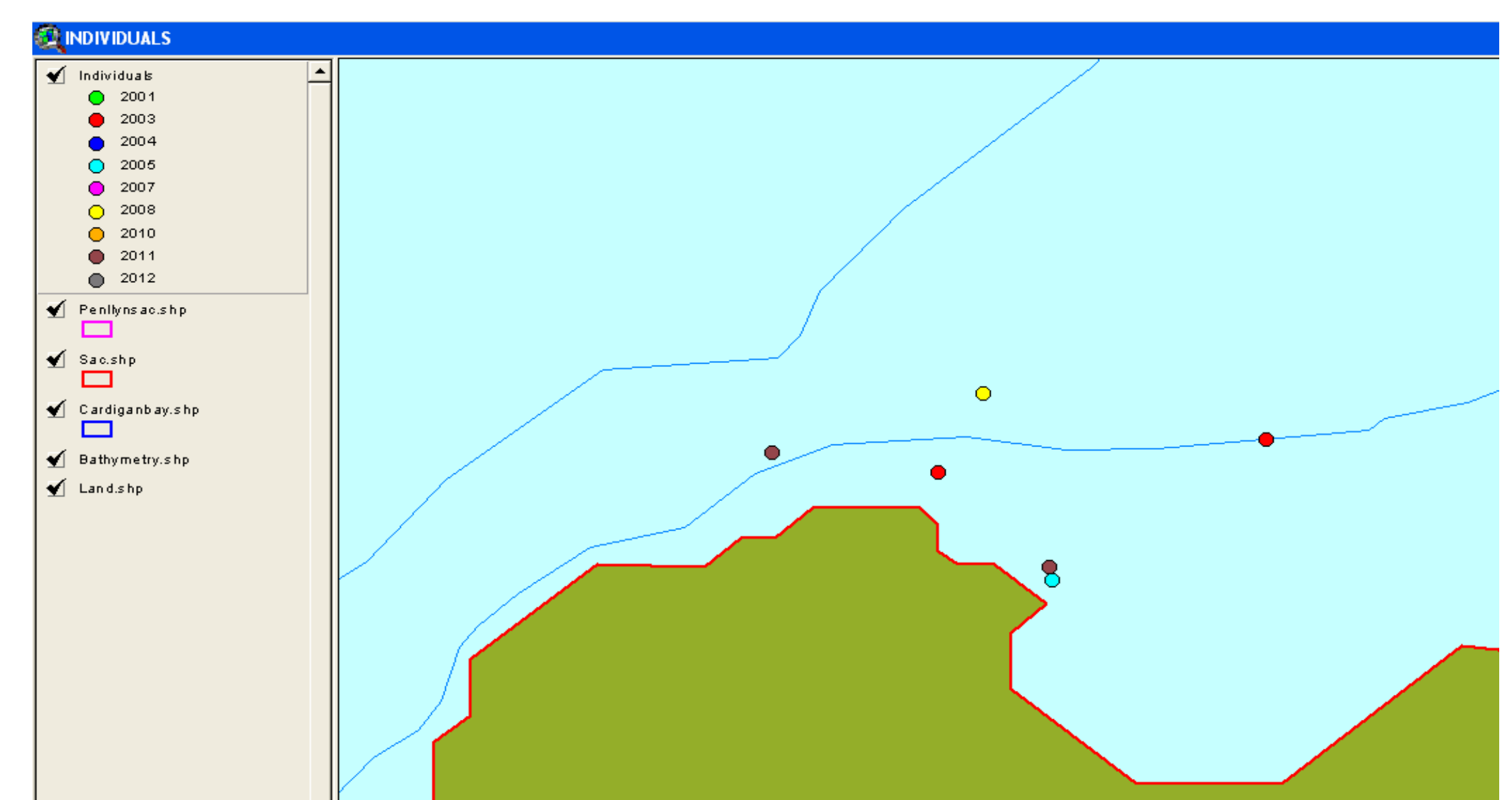


Figure 5: ArcView GIS screen shot of New Quay harbour and headland displaying the annual presence of individual 060-01W

Conclusions

The results from the land-based watches highlight an annual increase in the presence of bottlenose dolphins within the New Quay harbour and headland area, whilst the photo-identification data show an annual increase in the site usage by different individuals. The continued annual summer presence of bottlenose dolphins within the New Quay area highlights this as an important site for supporting the Cardigan Bay population, which should therefore be considered in future management plans for the conservation of the species.

Acknowledgements

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