

## Short Note

### Long-Term Association Between a Solitary Common Dolphin (*Delphinus delphis delphis*) and a Harbour Porpoise (*Phocoena phocoena*)

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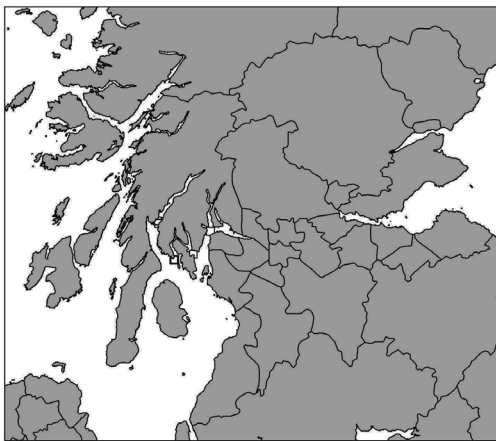
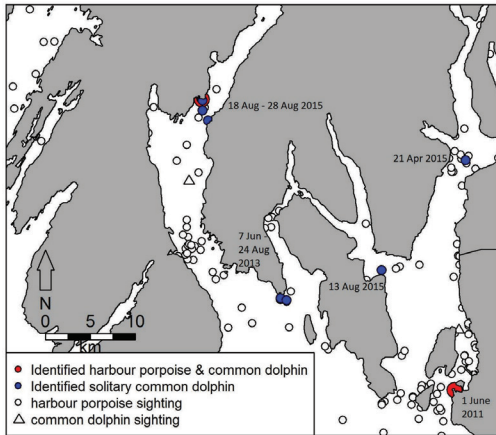
The common dolphin (*Delphinus delphis delphis*) has a distribution from tropical to cool temperate oceanic waters between 400 and 1,000 m deep, but occasionally occurs near bays and headlands (Cañadas et al., 2009; Murphy et al., 2013). It is the most abundant dolphin species in European Atlantic seas with groups often numbering several hundred individuals (Hammond et al., 2013). The occurrence of solitary dolphins (i.e., those in isolation from conspecifics) is well-documented in the case of bottlenose dolphins (*Tursiops truncatus*) along the western seaboard of northern Europe (Lockyer, 1990); however, cases of solitary common dolphins are more unusual (Vella, 2005; Genov et al., 2012). This may be due to their offshore distribution which makes longitudinal studies of individuals (e.g., by photo-identification) more difficult. Common dolphins are known to range over large distances—for example, 400 km in 5 d (Zagzebski et al., 2006) and, in exceptional cases, a minimum of 1,000 km in just under 2 y (Genov et al., 2012). Herein, an unusual case of an individual common dolphin associating with a harbour porpoise in a semi-enclosed fjordic system is reported.

Between 2011 and 2015, the Hebridean Whale and Dolphin Trust received reports of 18 common dolphin sightings and 268 harbour porpoise sightings within the Firth of Clyde, Scotland, via a public sightings network ([www.hwdt.org](http://www.hwdt.org)). Of these records, 13 comprised solitary common dolphins observed between April and August in Loch Fyne or adjacent sea lochs (Figure 1). Photographs from seven sightings confirm the individual identity of the dolphin using a distinctive notch near the top of the dorsal fin (Figure 2). During many encounters, the common dolphin approached vessels to bow-ride, a behaviour typical of this

species. Some observers noted that the dolphin would never stray far from navigational buoys to which it has an apparent affinity.

On 1 June 2011 and again on 25 August 2015, the dolphin was photographed under water using pole-mounted underwater cameras. On both occasions, it was accompanied closely by a harbour porpoise, and the pair were bow-riding the vessel from which the filming took place. The harbour porpoise also was identified as the same individual from both occasions due to distinctive patterns in the pigment on its flank, in addition to a distinctively shaped dorsal fin with a bulbous leading edge (Figure 2). We consulted with seven cetacean researchers based throughout the UK who had extensive field observation experience with both species and asked them whether or not the harbour porpoise could be a hybrid based on morphological features alone. Five said no, two were uncertain, and none said yes; therefore, we conclude that the harbour porpoise was unlikely to have been a hybrid.

To our knowledge, neither short- nor long-term associations between common dolphins and harbour porpoises have been previously documented. The most recent sightings occurred in Loch Fyne, which is the longest sea loch (or fjord) in Scotland, extending 65 km inland from the Firth of Clyde. This is not a typical common dolphin habitat; however, harbour porpoises are regularly sighted in the area (Figure 1). Sea surface temperatures in the nearby Firth of Clyde range from ~6° C in April to ~13° C in August (Slesser & Turrell, 2005); this is close to the 7° to 12.3° C thermal thresholds previously published for harbour porpoises (MacLeod et al., 2007; Murphy et al., 2013).



**Figure 1.** Map of central Scotland and expanded upper Clyde showing location of sightings of harbour porpoises (*Phocoena phocoena*) and common dolphins (*Delphinus delphis delphis*) between 2011 and 2015; all photographs of a solitary common dolphin were of the same individual as that photographed with the individual harbour porpoise.

In each of the photographs and video frames examined, the harbour porpoise occupied the echelon position; this is generally seen in cases of mother-calf pairs wherein the calf may benefit from using the slipstream generated by the mother (Noren & Edwards, 2011). Interactions between harbour porpoises and several other cetacean species are well-documented, including predation by killer whales (*Orcinus orca*) (Ford et al., 1998); attacks by bottlenose (Ross & Wilson, 1996), white-beaked (*Lagenorhynchus albirostris*) (Haelters & Everaarts, 2011), and Pacific white-sided (*L. obliquidens*) dolphins (Baird, 1998); and interbreeding with Dall's porpoise (*Phocoenoides dalli*) (Willis et al., 2004). However, the case presented herein appears to be unique in that none of the following behaviours, which were previously found to arbitrate interspecific associations, can be attributed to these individuals: cooperative feeding (Herzing & Johnson, 1997), aggression (Ross & Wilson, 1996), object-oriented play (Deakos et al., 2010), or displaced epimeletic (care-giving towards an individual of another species) behaviour (Baird, 1998). Following Herzing & Johnson (1997), the most appropriate description of the behaviours observed is “affiliative,” which includes travel, play, and neutral association. However, the reasons behind this unusual and long-term association are not known.

Based on consultation with experienced researchers, the conclusion has been drawn that the harbour porpoise is unlikely to be a hybrid. Furthermore, there are no documented incidences of hybridisation between members of the families Phocoenidae and Delphinidae, presumably because they are so taxonomically disparate. The individually identified harbour porpoise was photographed at two sites 50 km apart over a period of 4 y, demonstrating fidelity to a discrete area, which has not been previously documented in this species in this region. These observations highlight the value that public sighting schemes can



**Figure 2.** Photographs demonstrating how the individual common dolphin and harbour porpoise were matched using natural markings and scars (red boxes). Photographs were taken on 1 June 2011 (left) and 18 August 2015 (right).

have in shaping our understanding of cetacean distribution, movements, and behaviour.

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