

Long-distance movement of a lone short-beaked common dolphin *Delphinus delphis* in the central Mediterranean Sea

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While short-beaked common dolphins are often regarded as highly mobile animals, their movements and ranging patterns are poorly known and no long-distance movements have been documented through photo-identification of individuals. We report the long-distance movement of a naturally marked individual, encompassing a minimum of 1000 km across the Ionian and the Adriatic Seas, and the subsequent behaviour and site fidelity of the same individual, in association with a calf, in and around the commercial port of Monfalcone, northern Adriatic Sea. This is the longest documented movement for any individual of this species, worldwide.

Keywords: short-beaked common dolphin, *Delphinus delphis*, movements, behaviour, photo-identification, Mediterranean Sea

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INTRODUCTION

The short-beaked common dolphin *Delphinus delphis* (hereinafter ‘common dolphin’) has faced a major decline in abundance and distribution in the Mediterranean Sea in recent decades (Bearzi *et al.*, 2003). In the coastal waters of Greece, a local population of common dolphins inhabiting the Inner Ionian Sea Archipelago has undergone a decline from around 150 animals in 1996 to only about 15 in 2007 (Bearzi *et al.*, 2008), likely due to prey depletion resulting from overfishing (Bearzi *et al.*, 2010; Gonzalvo *et al.*, 2010; Piroddi *et al.*, 2010). In the northern Adriatic Sea, common dolphins were historically abundant but had virtually vanished by the 1970s (Bearzi *et al.*, 2003, 2004).

While common dolphins are often regarded as highly mobile animals, their movements and ranging patterns are poorly known (Natoli *et al.*, 2006; Mirimin *et al.*, 2009). To our knowledge, no long-distance movements have been documented through photo-identification of individually identifiable animals. This paper reports: (1) the long-distance movement of a naturally marked individual, encompassing a minimum of 1000 km across the Ionian and the Adriatic Seas; and (2) the subsequent behaviour and site fidelity of the same individual, in association with a calf, in and around the commercial port of Monfalcone, northern Adriatic Sea.

METHODS AND RESULTS

In June 2010, an adult–calf pair of common dolphins—the adult a presumed mother—was observed in the port of

Monfalcone, an industrial town near Trieste (northern Adriatic Sea, 45°04′N 13°03′E; Figure 1). These dolphins were repeatedly sighted there between June 2010 and January 2011, in an area of 1.2 km². High-quality digital photographs of the dorsal fin of both animals were taken for individual photo-identification (Würsig & Jefferson, 1990) and video footage was obtained on some occasions. The adult appeared in good physical condition, with no evidence of injuries, malnutrition or skin disease based on images of its dorsum. The calf—about half the length of the adult—initially appeared in good condition but started showing signs of emaciation by January 2011. It was estimated to be about one year old at the beginning of the observation period, based on a comparison with photographs of animals of known age taken in the Ionian Sea. In February 2011, the calf disappeared. After this, the adult was absent from the port on several occasions and could not be found in the adjacent waters within a 6 km radius. However, the animal returned to the port occasionally between February and May 2011. In May 2011, the adult was filmed 4.5 km from Monfalcone. In June, July and August 2011 it was observed repeatedly between Monfalcone and the city of Trieste (22 km south-east of Monfalcone), within 1 km of the coast. During some encounters, both inside and outside of the port, the animal was quite active, performing bowriding, leaps, breaches, side-slaps, tail-slaps and carrying jellyfish *Rhizostoma pulmo* between its pectoral fins while swimming belly-up at the surface. Some of the observed behaviours were suggestive of foraging and playing.

A comparison with a catalogue of 171 naturally marked common dolphins from the Inner Ionian Sea Archipelago, Greece (Bearzi *et al.*, 2008), revealed that the adult was encountered there in August 2008, in a group composed of eight adults and one calf. Although most photo-identified animals in the Inner Ionian Sea Archipelago were sighted

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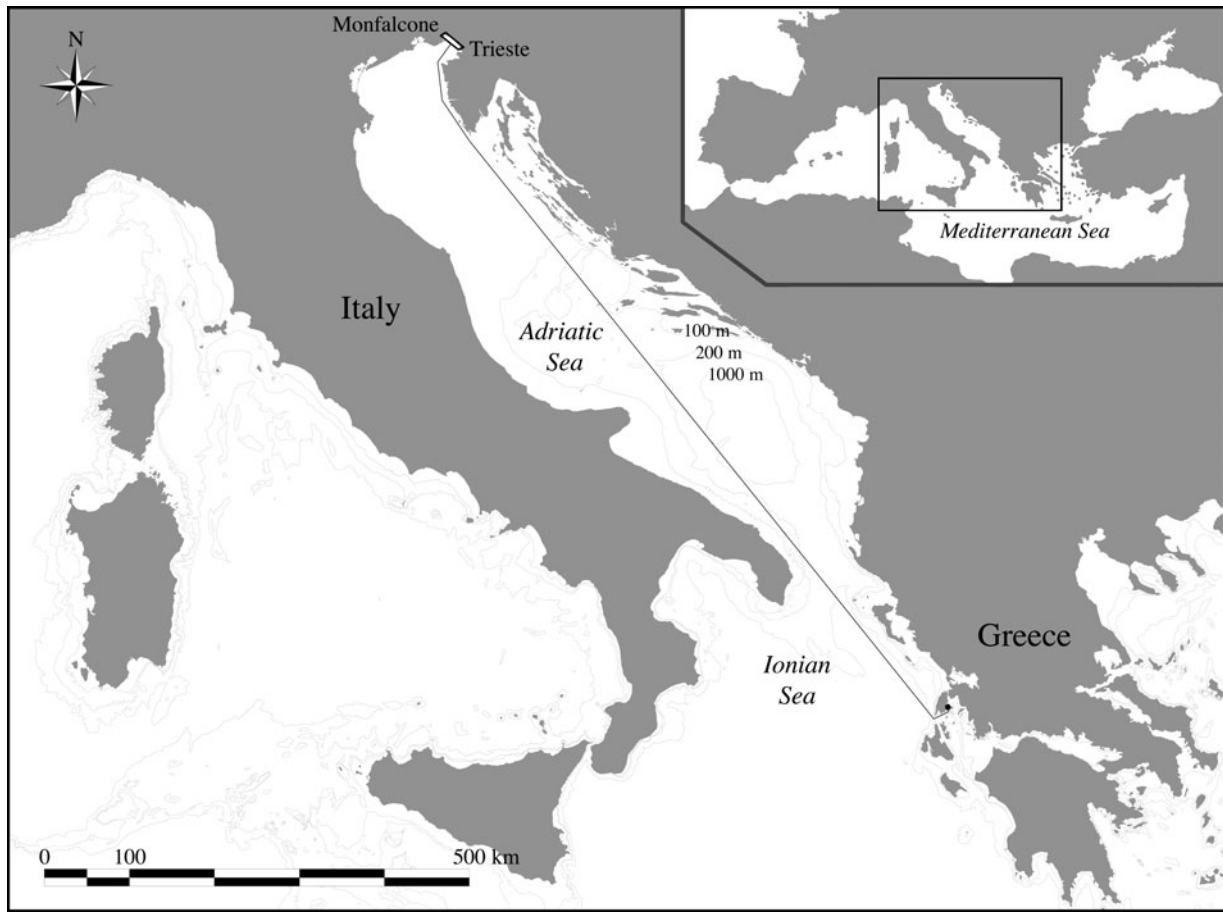


Fig. 1. Minimum distance travelled by the adult common dolphin, with some of the locations cited in the text.

regularly, this particular animal was encountered in that area only once. If moving in a straight line, the animal would have travelled a minimum of 1000 km between the two sites (Figure 1). This is the longest documented movement for any individual of this species, worldwide.

DISCUSSION

Common dolphins are generally thought to be wide-ranging. For example, a radio-tagged female common dolphin off the coast of California travelled at least 500 km in 10 days (Evans, 1982). Genetic studies of common dolphins in the Mediterranean Sea and North Atlantic Ocean further support the notion that these animals perform long-distance movements (Natoli *et al.*, 2006). However, such movements have never been documented based on individual photo-identification, probably due to scarce application of this method to common dolphins (Neumann *et al.*, 2002; Bearzi *et al.*, 2011).

In most mammals dispersal is biased towards males (Greenwood, 1980). Females are usually philopatric while males tend to disperse. As revealed by genetics, this also appears to be the case in at least some populations of common bottlenose dolphins *Tursiops truncatus* (Möller & Beheregaray, 2004), but not in others (Natoli *et al.*, 2005). Genetic studies of short-beaked common dolphins from the Mediterranean and North Atlantic showed no marked differences in dispersal between sexes (Natoli *et al.*, 2006, 2008).

The observation reported here refers to an individual that moved to a part of the Mediterranean Sea—the northern Adriatic Sea—where the species no longer occurs (Kryštufek & Lipej, 1993; Bearzi *et al.*, 2004; Genov *et al.*, 2008). Additionally, this particular animal seems to have settled in a port for several months. Such behaviour is atypical for this species. Bottlenose dolphins frequently approach and enter ports and a number of single individuals have taken residence in urban areas (Lockyer, 1990; Eisfeld *et al.*, 2010). Common dolphins, however, have rarely been reported to do that. One case involved the presence of two long-beaked common dolphins *D. capensis* in two small bays on the central coast of Chile for 10 years (Bernal *et al.*, 2003). Given the circumstances, care must be taken in interpreting and assessing the ecological significance of the reported long-distance movement for Mediterranean common dolphins on the whole.

Still, this study indicates the value and the potential of photo-identification to gain insights into common dolphin movement and ranging patterns. Comparisons among the existing common dolphin photo-identification catalogues would therefore be worthwhile and may provide further insight.

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