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SHORT COMMUNICATION

Confirmed sightings of the Killer Whale, *Orcinus orca*, in Iranian waters (Mammalia: Cetacea)

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Killer Whales (*Orcinus orca*) are found in all of the world's oceans and seas. They are typically concentrated in cold and temperate waters at higher latitudes, especially in areas of high productivity (Ford, 2018). There are however numerous records to suggest wide-spread occurrence of the species throughout tropical and subtropical waters, although they are generally thought to be less abundant in these areas (e.g. Jefferson, Webber, & Pitman, 2015). Killer Whales have been recorded in small numbers throughout the Northern Indian Ocean and adjacent seas, including the subtropical waters of the Persian Gulf, Red Sea and Arabian Sea (Baldwin, Gallagher, & Waerebeek, 1999; Notarbartolo di Sciara et al., 2018; NIOKWA, 2018). However, records for the Middle East remain largely anecdotal, scarce and sporadic. For instance Leatherwood, Prematunga, Girton, McBrearty, Ilangakoon, and McDonald (1991) reported a sighting of six killer whales in the Persian Gulf. However, the location provided is approximately 38 km inland of Bandar Abbas (Iran), and thus the actual sighting location is uncertain. (Braulik et al., 2010).

The Plan for the Land Society in Iran has been working in collaboration with the Department of Environment Iran (DoE) since 2010 to document cetacean strandings in the Persian Gulf and Gulf of Oman. As part of this project an informal network was established among fishermen and coastal communities to report cetacean sightings and strandings. Here we report on sightings reported by fishers in the network.

Sighting 1. On 14 May 2017, two Killer Whales were reported to have been sighted near to Hendorabi Island, Hormozgan Province (26°35'N, 53°41'E) in waters approximately 40 m deep. The fishermen followed the whales for 10–15 minutes and used a mobile phone to capture images and video footage of the encounter (<https://vimeo.com/album/5703986> - Sighting 1). Two individuals can be distinguished, an adult male and a female or subadult male (F/SM) (Figure 1). Surface behaviours such as tail-slapping, porpoising and close passes both alongside and under the boat were observed. The fishermen report that the Killer Whales were in close proximity to a large shoal of sardines which they were seen to be “chasing”. Feeding cannot be confirmed in the video.

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Figure 1. Killer Whales sighted off Hendorabi Island, Iran on 14 May 2017. Note: The F/SM animal was identified as the same F/SM individual from sighting 3. A-B. An F/SM Killer Whale; C. Male Killer Whale.

Sighting 2. On 5 June 2017, two Killer Whales were reported approximately two miles from Bushehr Port, Bushehr Province ($28^{\circ}45'N$, $50^{\circ}50'E$). A mobile phone was used to briefly capture video footage of the encounter (<https://vimeo.com/album/5703986> - Sighting 2.). In the footage, an adult male and F/SM can be seen trailing the boat, with the F/SM swimming and tail-slapping upside down in the boat's wake.

Sighting 3. On 13 February 2018, two Killer Whales were sighted in the Persian Gulf approximately 40 miles from Kish Island, Hormozgan province ($26^{\circ}34'N$, $53^{\circ}15'E$). A video footage was captured with a mobile phone (<https://vimeo.com/album/5703986> - Sighting 3.) and was of sufficient quality to verify a match of the F/SM animal identified in Sighting 1 (Figure 1a).

Images and footage from all three sightings were analysed in order to identify individuals using the nicks, tears and notches found on the dorsal fin. Suitable images were available for the adult male and F/SM from Sighting 1, and a single F/SM for Sighting 3 (Figure 1a). The footage provided for Sighting 2 was not of sufficient quality to be used for comparison but an adult male and F/SM were clearly present. A positive match was made (GG) between the F/SM animal in Sighting 1 and Sighting 3 (Figure 1a), and was independently verified (T. Collins and R. Pitman); these sightings were almost one year apart and thus represent the first re-sighting of a Killer Whale in Iranian waters.

The images and video footage from all three encounters were shared with the Northern Indian Ocean Killer Whale Alliance (NIOKWA). No matches were made between the identifiable individuals from Iran and those in the NIO catalogue. The re-matched whale is included in the NIOKWA catalogue as NIO073.

These sightings provide the first substantiated records of Killer Whale occurrence in Iranian waters. They include a confirmed re-sighting with a sightings interval of almost one year. This result, albeit singular, is suggestive of a pattern, though clearly more data are required for an assessment of how routinely Killer Whales might use Iranian waters.

At present, much of what is known about Killer Whales is the result of studies focusing on higher latitude regions, with much less information available for tropical and sub-tropical populations. As such any information confirming their occurrence in these regions is significant. It is thought that Killer Whales in tropical and sub-tropical areas are likely to have a generalist diet (e.g. Baird, 2002) and may occupy an extensive range, traveling long distances in search of prey (e.g. Olson & Gerodette, 2008; de Silva, 1987). Patterns of migration and/or residency in the North Indian Ocean remain unknown, but photographic data held by the NIOKWA catalogue demonstrate at least one long-range movement: a pod of killer whales sighted off Abu Dhabi (United Arab

Emirates) were also sighted approximately 3300 km away off the Southern Coast of Sri Lanka (Orca Project Sri Lanka, 2015). These new sightings will also be contributed to a larger collaborative effort that will broadly assess the species' occurrence, distribution and movement across the greater North Indian Ocean region.

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Disclosure statement

No potential conflict of interest was reported by the authors.

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