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Growing knowledge of cetacean fauna in the Emirate of Fujairah, UAE

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Abstract

Most records of cetaceans in the United Arab Emirates come from relatively few studies undertaken in Arabian Gulf waters. However, recent study off the coast of Fujairah, in the Gulf of Oman, has revealed a rich diversity of cetaceans with 11 or more species now known to occur in the emirate. Among them are three new records for the UAE, spotted, striped and rough-toothed dolphins, as well as infrequently recorded large whales such as sperm, Bryde's and blue whales. Most species are primarily distributed in offshore waters over 500 m deep, though some species, such as the Indo-Pacific common dolphin, also regularly occur closer to shore, including within the Port of Fujairah anchorage area. Continuing research aims to investigate the population size, status and structure of cetaceans present in waters off Fujairah using a variety of line transect, photographic, genetic and acoustic research techniques.

Introduction

There has been relatively little scientific study of cetaceans in the UAE. Many of the recorded species are known only from a few sightings at sea or from dead individuals washed ashore. Reviews of cetacean occurrence and distribution in the Arabian region as late as the 1980s (e.g., Leatherwood 1986, De Silva 1987) omit reference to the UAE entirely. Later reviews and accounts (Baldwin *et al.* 1999, Preen 2004) reveal that limited historical information is, however, available (Morzer-Bruyns 1971, Slijper *et al.* 1964) albeit largely unsubstantiated. Nineteenth century whalers and observers on 20th century merchant vessels were the first to document large whales in the Arabian Sea region (e.g., Brown 1957, Wray & Martin 1980, Reeves *et al.* 1991). Some species, such as humpback whales, were documented in UAE waters, including in the Arabian Gulf (Slijper *et al.* 1964) where they continue to occur today (Dakhteh *et al.* 2017). A record of a dead humpback whale was also documented off Khor Fakkan in 1973 (Baldwin *et al.* 1999).

Recent whaling also occurred in the Arabian region in three successive seasons during the period 1963 to 1966 (Mikhalev 1997, Mikhalev 2000), when illegal Soviet fleets swept northwards from the Gulf of Aden, along the eastern shoreline of the Arabian peninsula and eastwards across the Oman Sea as far as the Pakistan–India border. The final Soviet tally from this Arabian region campaign was 3,339 whales, including 1,294 blue whales, 954 sperm whales, 849 Bryde's whales and 242 humpback whales (Mikhalev 2000). Almost nothing is known of the population status of these species in the wider region today, with the exception of the humpback whale, for which a population estimate off Oman of 82 (95% CI = 60–111) individuals was estimated in 2008 (Minton *et al.* 2008), and appears little changed since then, suggesting no population growth since the whaling era.

Gallagher (1991) was among the first researchers to document occurrence of small odontocete cetaceans in the UAE based on data from six skulls collected between 1972 and 1973, representing three different species. Ad hoc surveys for small cetaceans in the mid-1980s, focusing on the Indo-Pacific humpback dolphin, *Sousa chinensis* (now known as *S. plumbea*), resulted in reports of several unidentified cetaceans, including large whales, but records are often vague, lacking supporting data.

More substantive information was collected later that decade (Preen 1989) during aerial surveys for dugongs, although only three species of dolphins were recorded. A dedicated study of the UAE's cetacean fauna in 1995 (Baldwin 1995, Baldwin 2003) increased the number of species recorded in the country to 13, including three species of baleen whale and ten odontocetes. The former Environmental Research and Wildlife Development Agency of Abu Dhabi (ERWDA) (now the Environment Agency Abu Dhabi–EAD) conducted summer and winter aerial surveys of western UAE waters in the Arabian Gulf in summer 2000 and winter 2001 (Al-Ghais & Das 2001). This focused on estimating the population size and distribution of dugongs, but also recorded incidental dolphin sightings. More recent surveys between 2014 and 2015 by the EAD Dolphin Conservation Programme revealed that the waters off Abu Dhabi hold the largest reported population of *Sousa plumbea* in the world comprising 701 (95% CI = 473–845) individuals (Diaz López *et al.* 2017). Other recent information has been collected during the course of the UAE Dolphin Project, with most records coming from Arabian Gulf waters.

Of all of these previous studies and surveys, only one (Baldwin 1995) refers to dedicated survey work conducted off the UAE East Coast of Fujairah.

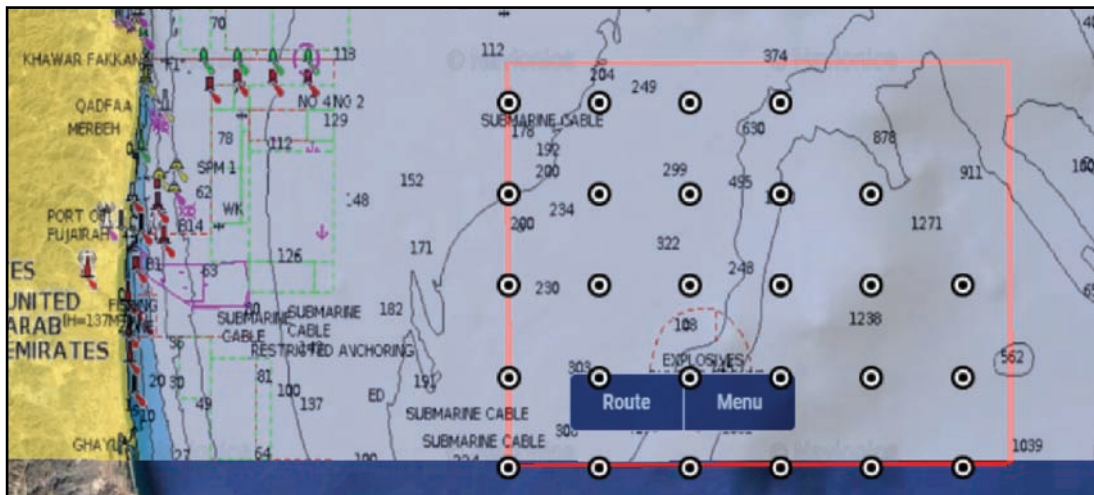


Figure 1. Fujairah Whale Research Project survey area showing transect stations (circles). Transects are typically surveyed along E–W orientation, but may also be surveyed along N–S orientation.

Establishing an updated baseline

The Fujairah Whale Research Project began in February 2017 and has included eight dedicated vessel surveys and one aerial survey for cetaceans to date, undertaken approximately every 3–4 months. Surveys were typically between 3 and 5 days in length and followed pre-designed survey transects. A minimum of three observers and consistent replication of survey methods allows for comparison between data sets. The survey area includes deep, offshore waters and is depicted in Figure 1.

Distribution of cetaceans off Fujairah

Cetaceans are distributed throughout the survey area, based on both sightings and acoustic detections made during vessel transect surveys. The majority of sightings were in relatively deep water (500 m+). The data reveal a concentration of sightings towards the southwest corner of the survey area, which is considered a ‘hotspot’ for several dolphin species. Figure 2 depicts a sub-set of sightings recorded during vessel-based surveys, as well as acoustic detections made during routine acoustic surveys using a drop-down hydrophone at transect stations.

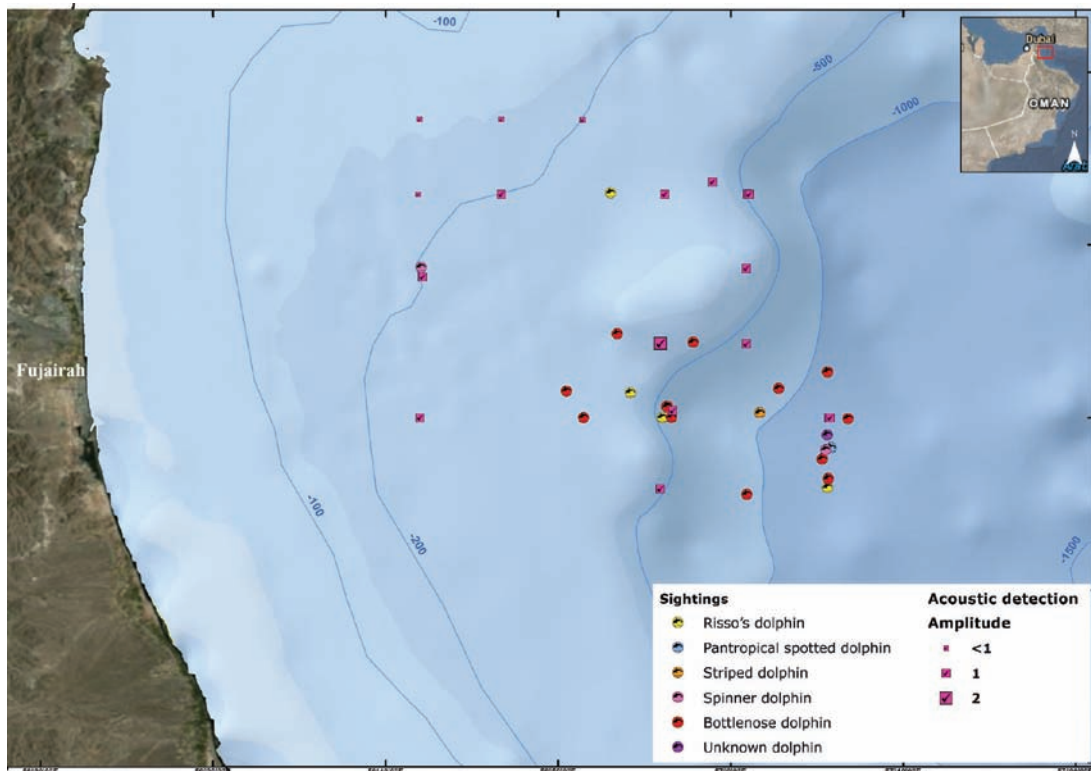


Figure 2. Summary of vessel-based observations and acoustic detections of cetaceans recorded during offshore transect surveys.

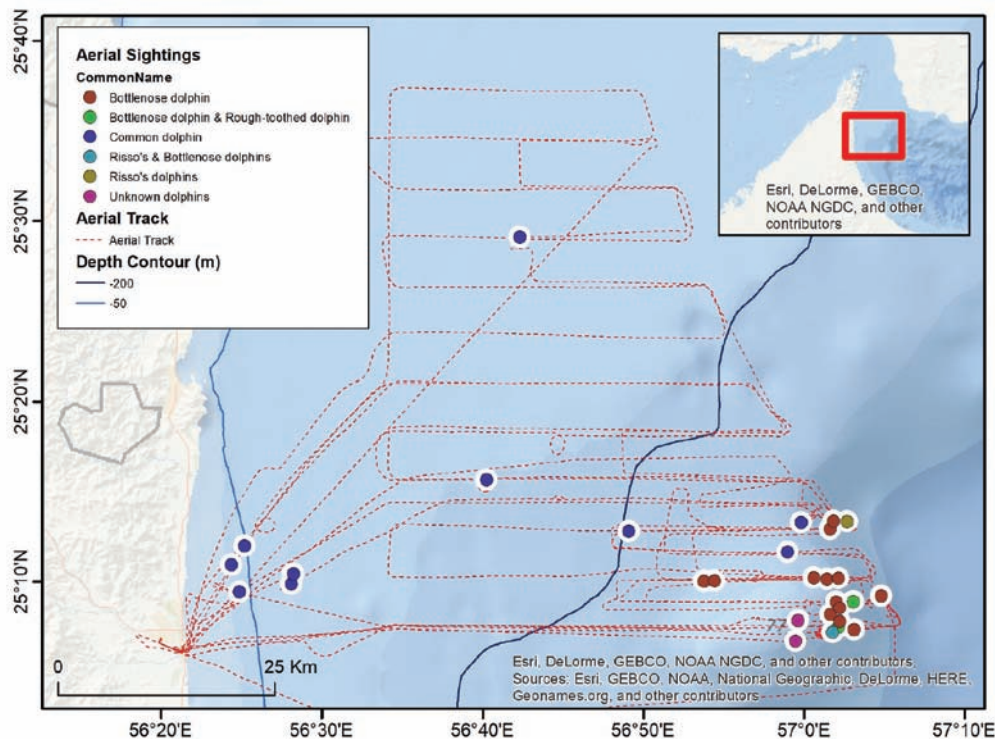


Figure 3. Summary of observations recorded during an aerial survey of waters off Fujairah in March 2018.

A dedicated aerial survey was conducted between 20–22 March 2018 inclusive. Flights were conducted both during the morning and the afternoon, with flights generally lasting 2–2.5 hours. A total of 2,414 kms were searched along predetermined transects. In terms of distribution, aerial survey results were similar to those of the vessel surveys in that the majority of sightings were recorded in

the southwest corner of the survey area (Figure 3). The aerial survey additionally revealed common dolphins between the survey area and shore, including in the Port of Fujairah anchorage. Observations (supported by photographs) recorded by Port of Fujairah personnel from work vessels have since revealed the repeated presence of common dolphins in this area.



Figure 4. Common bottlenose dolphins, *Tursiops truncatus* (photo by Jacky Judas).



Figure 5. A small group of rough-toothed dolphins, *Steno bredanensis* revealed by our aerial survey, representing a first record of the species for the UAE (photo by Andy Willson).

Cetacean species recorded off Fujairah, including new records for the UA

Figures 2 and 3 show the distribution of a range of species recorded during vessel and aerial surveys. Of the species recorded, three represent new records for the UAE, including pantropical spotted dolphin (*Stenella attenuata*), striped dolphin (*S. coeruleoalba*) and rough-toothed dolphin (*Steno bredanensis*; Figs 5–7).

Other records from the recent vessel and aerial surveys included common bottlenose dolphin (*Tursiops truncatus*), Indo-Pacific common dolphin (*Delphinus delphis tropicalis*), Risso's dolphin (*Grampus griseus*) and spinner dolphin (*Stenella longirostris*; Figs 4, 8–10, 12–13).

Additional third party observations (with photographic evidence) were reported, including sperm whale (*Physeter*

macrocephalus) and Bryde's whale (*Balaenoptera edeni*). A reported sighting of orca (*Orcinus orca*) was also received and, although it was not supported by photographic evidence, is thought to be an accurate identification.

Species that have been additionally recorded in the literature in the past (Baldwin 1995, 2003), but for which no recent evidence is available, include false killer whale (*Pseudorca crassidens*). The blue whale (*Balaenoptera musculus*) is considered highly likely to occur in Fujairah waters from time to time, based on a stranding of a dead blue whale at Khor Fakkan, Sharjah reported in November 2017 (with photographic evidence).



Figure 6. Pantropical spotted dolphin, *Stenella attenuata*, previously unrecorded from the UAE (photo by Robert Baldwin).



Figure 7. Striped dolphins, *Stenella coeruleoalba*, previously unrecorded from UAE waters (photo by Robert Baldwin).



Figure 8. Indo-Pacific common dolphins, *Delphinus delphis tropicalis* (photo by Balázs Buzás).



Figure 9. A large group of Indo-Pacific common dolphins, *Delphinus delphis tropicalis* seen from the air (photo by Robert Baldwin).



Figure 10. Indo-Pacific common dolphins, *Delphinus delphis tropicalis* (photo by Balázs Buzás).

Strandings reveal conservation concerns

Two dead sperm whales have been recorded at Fujairah in recent years; one washed ashore on a beach next to Fujairah Port in 2012 and more recently one was found by Fujairah Port authorities on 15th June 2017, floating at sea approximately 1 nautical mile from the port breakwater.

In both cases, determination of the cause of death was not possible. Broken bones noted during the recovery of the skeletons could have been caused by a ship strike, and/or by bulldozers and cranes when moving the carcasses on the beach. The proximity of both animals to the port, and the condition of the carcass in the recent case, suggests that death occurred close by and that ship strike may have been the most likely cause.

The dead male blue whale found near the port in Khor Fakkan (on 27th November 2017), also had suspected ship strike injury. The evidence of potential ship strike on this whale highlights the need for more comprehensive management of shipping activities to avoid unnecessary whale mortality. Work has already begun at the Port of Fujairah to help address this issue.

Both sperm whale carcasses were recovered. The more recent skeleton remains buried to allow for decomposition, whilst the skeleton from the 2012 stranding was recovered, treated and cleaned (Fig. 11) in preparation for a proposed public display.



Figure 11. Sperm whale, *Physeter macrocephalus* bones recovered from a stranding at Fujairah in 2012 (photo by Robert Baldwin).

Recommendations for further study

The Fujairah Whale Research Project has begun collection of behavioural and acoustic data, as well as samples for future genetic analysis. Analysis of photographs as part of a photo-identification study has also begun on specific species (e.g., bottlenose and Risso's dolphins). It is recommended that these studies are continued and expanded where possible, and that dedicated transect surveys, both vessel-based and aerial, are repeated in the future. This combination of work will enable detailed investigation of populations status, size and structure of cetaceans off Fujairah and will provide information of value to conservation planning as well as planning for a 'blue economy', such as that related to marine tourism and other maritime industries. It is additionally recommended that a specific study of Indo-Pacific common dolphins in the Port of Fujairah anchorage is initiated due to the potentially interesting interaction between this species and the on-going shipping and industrial activities at the port.

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Figure 12. Risso's dolphins, *Grampus griseus* (photo by Balázs Buzás).



Figure 13. A Risso's dolphin, *Grampus griseus* detected by aerial survey (photo by Robert Baldwin).

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