

Combining Research with Education for Cetacean Conservation in Fethiye-Göcek SEPA Turkey

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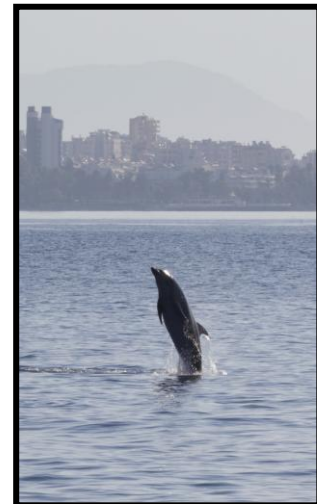
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SUMMARY

Unknown abundance, distribution and movement patterns of bottlenose dolphins has contributed to lack of effective conservations within the Levantine Sea, whose population has assumed to have decreased by 30% in the last 50 years. Nationwide updated information is therefore a high priority. The project was designed for the purpose of collecting baseline data on cetacean distribution, abundance, initiate the first photo-ID catalogue, and identify important habitats and major threats within the Special Environmental Protected Area Fethiye-Göcek as well as to raise public awareness through ensuring the active involvement of fishermen, boat crews and children.

Fethiye-Göcek SEPA is a protected area since 1988 and Antalya Bay has pinpointed as a "High Conservation Priority Area", yet there is an immense and unacceptable absence of appropriate conservation measures within those habitats that are not only host to a variety of species high up within the tropic pyramid, but also those that shelter extremely important, economically valued fish species. Majority of personal communication with fishermen postulated that marine mammal density was rather high in previous years with a sharp decline recently. In addition to the low population size, all the sighted individuals showed considerable starvation signs with many skin parasites. All these signs raised a concern on the population states of marine mammals in the area. Thus, in order to minimize the negative impacts on the population, various regulations are required urgently.

We hope that our study will be the based step to create the effective conservation measures in the north-western Levantine Sea and recommend that further research has to be carried out to evaluate the changes on the population health and the pattern on their area usage. Most importantly, governmental bodies has to be involved to the project activities and the results has to be used for effective conservation measures that should be implemented as soon as possible for protecting the marine biodiversity of north-western Levantine Sea.



SCIENTIFIC SURVEYS

Surveys have been conducted in Antalya Bay, Finike Bay and Fethiye Bay in the north-western Levantine Sea. While 9 scientific seasonal surveys have been conducted both in the coastal and offshore waters of Fethiye-Göcek SEPA, 23 boat surveys and 134 land surveys have been conducted in the Antalya Bay (Figure 1). Total transect length on the search of marine mammals was calculated as 1,500 km.

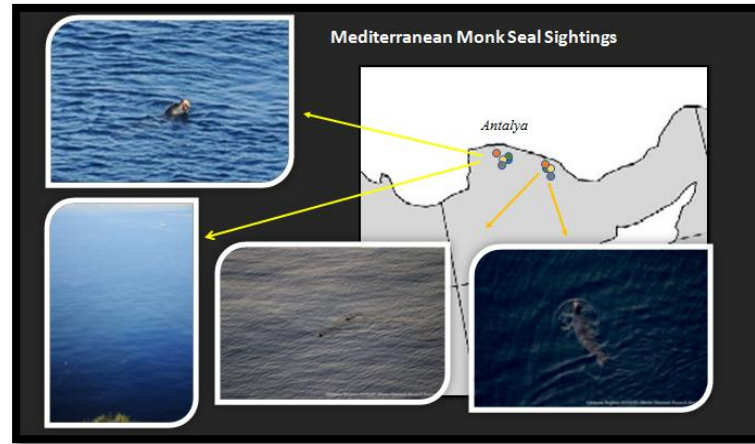
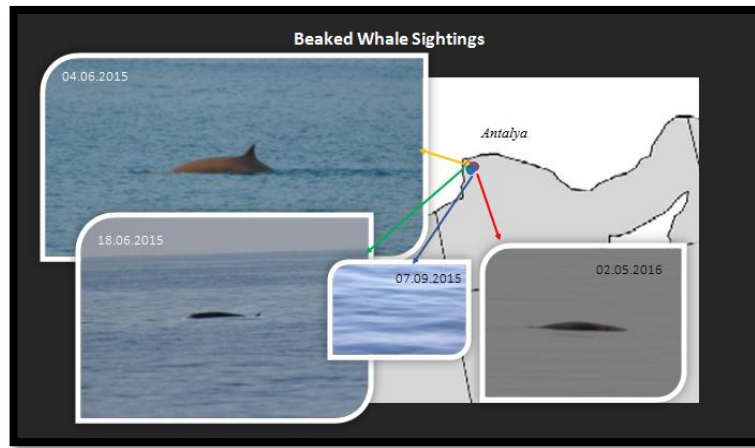


Figure 1: Study survey area and the boat transects that were followed in the north-western Levantine Sea

In total, four cetacean species (bottlenose dolphins, striped dolphins, Risso's dolphins, beaked whales), one Pinnipedia species (Mediterranean Monk Seals), two sea turtle species (loggerhead turtle and green turtle) have been sighted (Figure 2, Picture 1).

SPECIES	SIGHTING NUMBER	LOCATION
BOTTLENOSE DOLPHINS	50 DAYS	ANTALYA BAY
	3 DAY	FETHIYE-GOCEK
BEAKED WHALES	4 DAYS	ANTALYA BAY
MEDITERRANEAN MONK SEALS	11 DAYS	ANTALYA BAY
	1 DAY	FETHIYE-GOCEK
RISSO'S DOLPHIN	1 DAY	ANTALYA BAY
STRIPED DOLPHIN	1 DAY	ANTALYA BAY

Figure 2: Marine Mammal Sighting number in the north-western Levantine Sea



Picture 1: Beaked whales and Mediterranean monk Seal sightings in Antalya Bay.

All the sighted marine mammal species showed high seasonal site fidelity in the north western Levantine Sea. While cetacean sighting rate was considerably higher in spring and summer in the north-western Levantine Sea, no cetacean presence was recorded during winter months (Figure 3).

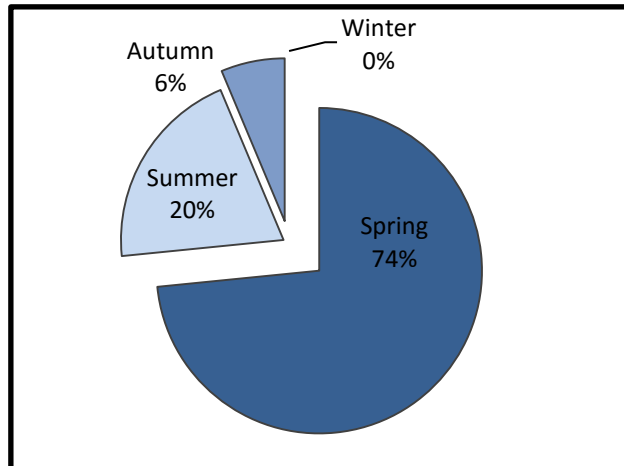
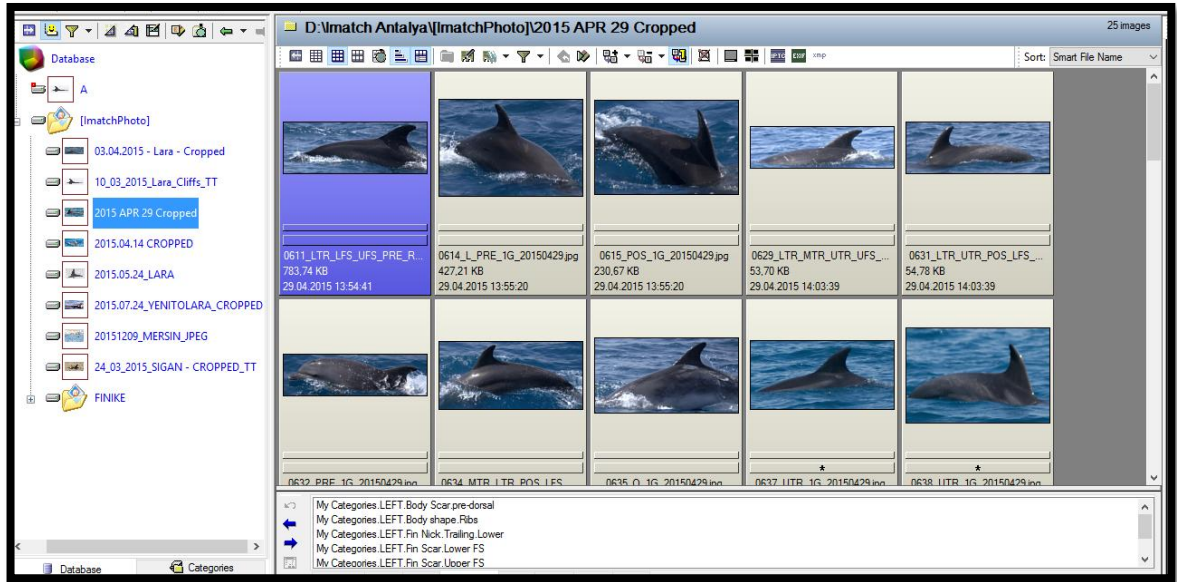


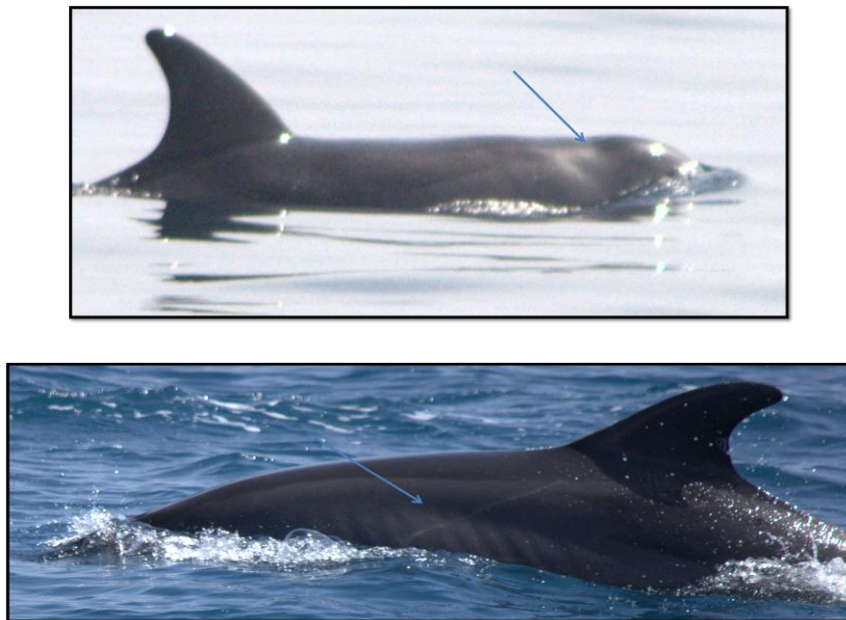
Figure 2: Changes on seasonal sightings of bottlenose dolphin

Moreover, majority of the bottlenose dolphin sightings were strictly coastal and took place between 0 to 200 isobaths, whereas beaked whales were sighted between 600 m to 1000 m depth zones.

In addition, 51 individuals of bottlenose dolphins were catalogued, of which 18 were re-sighted the subsequent year. The photo-ID catalogue will be online in 2017 to increase the outreach and effectiveness of our project activities (Picture 2). The identified dolphins showed visible starvation signs, skin parasites and considerable avoidance behaviour to the vessel presence (Picture 3).



Picture 2: Screenshot of bottlenose dolphin photo-ID catalogue in the north-western Levantine Sea



Picture 3: Examples of individuals with starvation signs.

EDUCATION SURVEYS

After September 2015, we have organized boat tours for in-need children to inform them about marine mammals and other relevant subjects regarding marine life in November 2015, April and May 2016. First we managed to reach the kids living in under developing areas of Fethiye.



Secondly, we communicated to Fethiye Municipality and ÇODEM (Children Education and Support Center). Our boat tours for kids were organized inside the Fethiye-Göcek SPA Area and while we and children were observing the sea for marine mammals encounter, we provided them go pros and cameras to record the nature from their eyes. Besides, all kinds have been explained and trained about marine life, mammals and importance of nature by presentations, book-leafs and fliers. We also dispersed T-shirts with different marine mammals pictures and information to motivate them.

In some of our boat tours, we have encountered different marine animals like dolphins, sea turtle, swordfish and even sharks. Upon observing the animals, we explained the species, its population statues, major threats on its survival and what we al can do to protect them.



At the end of the project in July 2016; we have planned a public awareness day with TURMEPA (Clean Sea Association) to present what we did in Fethiy-Göcep SPA. Also we had a good communication with TURMEPA which is working on coastal cleaning in Fethiye and shared our activities. Although all public awareness day materials like presentation, project movie, booklets of marine mammals, t-shirts etc. were ready, because of the coup attempt in Turkey, we had to postponed the awareness day at a later date.



MEDIA

During the project activities, we released three different media news.

When we started to implement the project, “Sozcu Newspaper” which is one of the leading ones in Turkey reported our project. In the news below, they have stated the summary of our project and the importance of children education besides dolphin conservation.



After we started the project activities; upon organizing a dolphin boat tour for in-need children coming from villages, an interview with the local TV in Fethiye (KanalF) have been released and launched in the main news bulletin. On the TV news, our project director Dr. Aylin Akkaya Baş has clarified what DMAD is doing in Fethiye-Göcek SPA with the Rufford Foundation's support.

Later on we communicated with Fethiye Municipality and ÇODEM (Children Education and Support Center) and organized another boat tour for kids coming from ÇODEM. In this interactive tour, kids asked many questions about marine mammals and marine life and they have been informed detailed regarding topic. At the end of the tour, Fethiye Municipality released this report in their local conservation journal.

PUBLICATIONS

1. Bas. A.A., Lagoa J.C., Atchoi E. 2016. New records of Cuvier's beaked whales (*Ziphius cavirostris*) from the Turkish Levantine Sea. Turkish Journal of Zoology. DOI: 10.3906/zoo-1509-19
2. Bas. A.A., Piludu N., Atchoi E., Lagoa J.C. 2016. Recent sightings of the critically endangered mediterranean monk seal *Monachus monachus* (Hermann 1779) in Antalya Bay, Turkey and implications for conservation. *Monachus Guardian* (<http://www.monachus-guardian.org/wordpress/>)
3. Bas. A.A., Eleman A. 2016. Bottlenose dolphins (*Tursiops truncatus*) in the Turkish Levantine Sea: Individual identification, residency patterns and home range. Türkiye Deniz Bilimleri Konferansı 2016. ODTU Kültür ve Kongre Merkezi Ankara. 31 May-3June 2016. pp. 77.
4. Bas. A.A., Bas E. Combining Research with Education for Cetacean Conservation in Fethiye-Göcek SEPA, Turkey. "Nature knows no boundaries" Rufford Small Grants Foundation Conference. p. 23. Bosnia and Herzegovina. March 2016.
5. Bas A.A., Morris N.R.C. 2016. Encounter rates and site-fidelities of unstudied population of bottlenose dolphins in the north-western Levantine Sea, Turkey (submitted for publication to *HYLA: Herpetological bulletin*)
6. Bas A.A. 2016. Investigating the marine mammal biodiversity and delineating important marine mammal habitats in the north-western Levantine Sea, Turkey (preparation for publication).
7. Atchoi, E., Bas, A.A., Lagoa, J. Live sightings of beaked whales from the Turkish Levantine Sea. 2nd WCA Conference, Faial, Azores, October 2015.

FINAL NOTE

The results of current study revealed that bottlenose dolphins, striped dolphins, Risso's dolphins, beaked whales and Mediterranean Monk Seals are present in the north-western Levantine Sea, however majority of the sightings belongs to the bottlenose dolphins and monk seals. We suggest that cetacean sightings are seasonal with high site fidelity during spring and summer seasons and are absent from the survey sites during winter, which highlights that these animals have a much larger home range.

The encounter rate of bottlenose dolphins was considerably higher than those presented in the limited number of previous studies in the Levantine Sea. Spring encounters reached up to 12 groups and 100 individuals per 100 km. Ryan et al., (2014), had an estimated encounter rate of 0.006 groups/hour in 2013, while Dede et al., (2009) reported an overall cetacean encounter rate of 0.18 groups/10nm in 2008. These studies mostly comprised of single survey and were conducted during the summer months whereas current study comprised of year-round surveys with monthly survey effort. Thus, current study update the information on the bottlenose dolphin encounters and provides seasonal encounter rates for the north-western Levantine Sea.

Antalya Bay, without doubt holds an important bottlenose dolphin population during spring and summer months, while there were few individuals sighted in Fethiye-Göcek, only for summer months. There is, however a need for monthly surveys of a larger scale to outline the other important territories for dolphins in the Levantine Sea for an accurate critical habitat selection.

In addition, the catalogued individuals in two subsequent years were the same individuals in Antalya Bay which indicates high site fidelity of bottlenose dolphins whereas we couldn't analyse the site fidelity factor in Fethiye-Göcek as we had only one year data so far.

In regards to the education activities, our project focused mainly three different stakeholders; fishermen, local tour crews and children of Fethiye. While we have managed to develop a two-way mutually respectful relationship with tour boat crews and children, we need to spend more effort to secure the enrolment of fishermen as they had less willingness to do so, except the small scale fishery.

We have reached over 50 kinds in Fethiye-Göcek and have trained them on marine environment, the major threats on the populations and how we are each an important factor on the protection of these animals. Through providing an active involvement on children to our project, we started a stable ground on the sustainability of project as there was a considerable increase on their awareness and how they pursued nature after the project activities. However, we need to keep working with not only the same kids but we also need to contact with public schools for the hope of reaching more children, who are going to be responsible on nature in a near future.

Long to short, marine mammal distributions were seen to overlap with human activities throughout the study sites and specifically, bottlenose dolphins have shown considerable starvation signs, skin parasites and short-term behavioural changes due to anthropogenic influences. The same areas are intensively used by fishing fleets and recreational boating. There is no doubt that there is an adverse impact on marine mammals due to high level of human activities in the North-Western Levantine Sea. For the well-being of marine mammal populations in the area, scientific based surveys together with educational activities have to continue for effective conservation actions.

