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## Perspectives

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Vol. 6 (2): December 2003

### SEEKING ANSWERS IN THE GULF OF ISKENDERUN: DO EASTERN MEDITERRANEAN MONK SEALS MIGRATE

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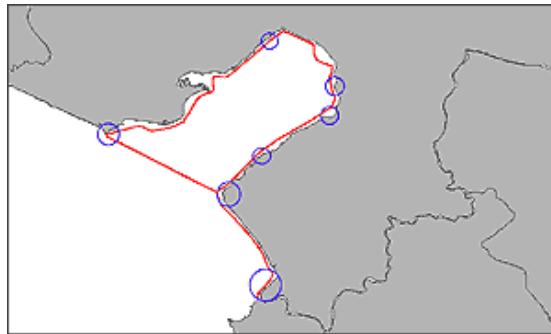
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Until recently, studies specifically targeting the Mediterranean monk seal in the Gulf of Iskenderun were very scarce, the species only being considered within the framework of general marine biology studies. Nevertheless, the issue was briefly included in the "Conservation of the Mediterranean Monk Seal in Turkey: Cilician Basin (TR0019.03)" and the "Mersin-North Cyprus Project (TR0015.03)" – projects supported by WWF International, Europe/Middle East Program (Gucu et al. 1997, 1998, 1999). Furthermore, Middle East Technical University, Institute of Marine Sciences (METU-IMS), has carried out various marine biological surveys since the 1980s, some of which addressed monk seal distribution in the area.

The northern part of the Gulf of Iskenderun is characterized by low topography, sand dunes and very heavy industrial developments, with marine terminals and their respective coastal infrastructures. Therefore, the area has never been considered among the important monk seal habitats in Turkey. However, interviews with local fishermen during an Environmental Impact Assessment study conducted for Baku-Tbilisi-Ceyhan Pipeline construction indicate that monk seals have been seen along the coast at Yumurtalık and particularly around Sugozu, where the marine terminal of the pipeline is located. Consequently, the Mediterranean monk seal is identified as one of the key priority themes of the Environmental Investment Program launched by BTC Co, which selected the METU-IMS to conduct research on the species.

The research project, which began on 1 August 2003 is, to a great extent, based on monk seal research and conservation experiences gained in the Cilician Basin (west coast of Mersin, 100 n.miles west of the Gulf). The goal of the project is to clarify if the species has a resident colony in and around the Gulf. The project also aims to conduct scientific research on the species to shed light on colony size, distribution, ecology and behavior. If the survey results indicate a viable seal colony in the area, the threats to survival of the colony will be determined and a baseline for future studies aiming at conservation of the species will be provided.

In October 2003, the first phase of the research was completed and the coastline between Karatas (Adana) and the Turkey-Syria Border was surveyed following the route depicted in Figure 1. The research mainly focused on the region between Çevlik and the Turkey/Syria border, where the topography is characterized by ruggedness and steep mountains plunging into the Mediterranean, with a cliff bound coastline and a rapid deepening in the offshore direction.



**Figure 1.** Survey tracks – Red line is the entire survey track; blue circles are the underwater survey tracks.

The field survey was mainly conducted to discover caves actively used by seals. The coastal stretch, corresponding to monk seal habitat descriptions (Gucu et al. 2004) were recorded. When such areas were found, an inflatable boat manned by the expert team and composed of one scientist skin diving, one scientist driving the boat and one scientist recording data, surveyed the entire area. In addition to the caves with open access from sea, the coast down to a depth of 30 meters was checked for other caves with underwater entrances. When a cave entrance was found, a team member dived, entered the cave and checked whether an air chamber existed inside. A ROV (Remotely Operated Vehicle) was kept ready to explore the caves located deeper than 15 meters and having an entrance longer than 10 meters. Discovered caves were divided into four categories: **Active** in which one or more seals were sighted or there was evidence of seal use (e.g. tracks, body depressions, feces), **Breeding** in which whelping occurs, **Abandoned** in which seals were historically observed, but are no longer in use, and **Potential** which meet the requirements and descriptions (1) of a monk seal cave (IUCN/UNEP 1988), but lack any sign of use. Overall, 29 potential caves were discovered; however no seal was sighted during the survey.

Interviews with local fishermen, in an attempt to create a local information network for quick and accurate access to seal sightings from the region, was also undertaken during the survey. The first results revealed a sharp decline in the number of seal sightings after the 1990s. Intensive use of explosives for fishing and the sharp decline in fish stocks were noted as the most probable factors reducing the number of seals. Surprisingly, none of the fishermen interviewed spoke about the harm inflicted by the seals upon their livelihood, a distinct contrast to areas where high seal density exists. Although no sign of hostility against the seal was observed among the local fishermen, deliberate killing should also be considered as a significant factor for the decline, because at least two individuals (one in Turkey [Basusta, pers. comm.] and another in Syria [Mo et al. 2003]) have been deliberately killed within the last 5 years.

Seal sightings reported by the fishermen present a similar pattern: an individual enters an area, is sighted by the majority of the fishermen and disappears shortly after. For instance, the fishermen near the Syrian border reported a seal appearing in spring 2003; it remained in the area for a week or so, and then vanished. The fishermen on the north of the Gulf reported a similar behaviour with a month's delay, in summer 2003.

Research will continue until December 2004, and it may therefore be too early to speculate or draw conclusions on the basis of first research results. However, the difference in the dates of sightings in different locations may indicate that the area has never hosted a large, resident and isolated seal colony. The seals sporadically sighted in the area are members of a colony based elsewhere, and the home range of the Cilician monk seal is much greater than hitherto believed (Gucu et al. 2004).

The research results carried out on the coasts adjacent to the Gulf of Iskenderun, such as Syria (Mo et al. 2003), southern (Dendrinos & Demetropoulos 2003) and northeastern Cyprus (Gucu et al. 1995) represented very similar results (despite habitat suitability, very few and irregular sightings and no evidence of whelping), posing the question: "where do these sporadically sighted seals come from?"

The only exception to the low seal density areas in the eastern Mediterranean is the Cilician coast, where a resident, breeding colony exists [see [The Cilician monk seal colony is growing](#), this issue].

The project is now testing the hypothesis that the core of the Mediterranean monk seal colony in the eastern Mediterranean is based along the Cilician coast and that a part of the colony, due to as yet unknown reasons, is induced to migrate along the triangle intuitively drawn in figure 2.



**Figure 2.** Hypothetical movements of the seal within the eastern Mediterranean.

During the next phase, the research will therefore focus on possible seal movements/migrations in the eastern Mediterranean. An Active and Passive infrared monitoring system, which was successfully used to monitor seals on the Cilician coast, will be installed in the newly discovered caves. The system will record seal movements inside a cave, registering date and time. Furthermore, a 35-mm camera with built-in flash will be attached to the recording system. The movement sensor will automatically activate the camera when an event occurs. The recorded data and the films will be retrieved every 3 months, analyzed for activity pattern, and for photo identification of the seal(s) sighted in the region. The outputs will then be compared with the photo-identified seals of the Cilician coast.

The team is now in search of additional funding to expand the research area and to include the northeast of Cyprus Island.

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1) A typical Mediterranean monk seal ideally has an underwater entrance and pebble or sandy beach above the reach of sea wave with provision of shelter.