

## On-site Treatment of Injured Sea Turtles: A Case Study from the Island of Crete, Greece

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In Greece, since 1994, ARCHELON's Sea Turtle Rescue Centre (STRC) in Glyfada (Attica) receives and rehabilitates injured and sick turtles found all over Greece (Margaritoulis 2024). Despite the increase of the Centre's capacity to accommodate 40 turtles, there are times that the number of turtles in need of treatment exceeds it. In these cases, an effort is made to treat the surplus turtles locally, i.e. closer to the location where the turtle is found, with the help of local vets or facilities capable of hosting turtles. Two such facilities that do this regularly are the Hydrobiological Station in Rhodos Island (Corsini 1996) and the "Cretaquarium" in Gouves on the Island of Crete, both featuring seawater pools and adequate experience to handle cases of turtles found injured on these two islands. Whether or not an injured turtle will be transported to the above facilities is usually arranged in collaboration with the ARCHELON's STRC, since the latter receives all reports of injured turtle incidents from the nationwide Rescue Network (Panagopoulou et al. 2005). Here, we present a case of an injured loggerhead on Crete, found in the context of ARCHELON's monitoring program in Rethymno, that was locally treated.

The program in Rethymno includes, among others, early morning beach surveys to locate tracks of adult female loggerheads (emerged for nesting) and their hatchlings (emerged from nests), as well as night surveys to encounter nesting females, which are measured and tagged (Margaritoulis et al. 2009). During the morning survey of 12 June 2015, the ARCHELON team on duty (SD and volunteers) observed an unusual emergence track (Fig. 1). It seemed that

the turtle had many barnacles in her plastron or was dragging something heavy under her. This type of track was observed twice, on the same day, at locations close to each other at the beach sector of Sfakaki (35.3842°N, 24.5876°E and 35.3833°N, 24.5820°E). Both emergences resulted in abandoned egg chambers without egg-laying.



**Figure 1.** Unusual emergence tracks observed on 12 June 2015 at Sfakaki beach, Rethymno.

Triggered by curiosity to reveal the cause of the unusual track, SD surveyed Sfakaki sector during the night of 12 June without success. However, at the night survey of 13 June a similar unusual track with an abandoned egg-chamber was observed, and the survey team soon encountered the turtle itself trying to dig another egg-chamber. The turtle was badly entangled in fishing gear, mainly around the neck and front flippers. These were wrapped in so many fishing nets, fishing lines and ropes that she was unable to properly use her flippers to dig. Failing to complete once again the attempted egg-chamber, the turtle was restrained on her way back to the sea in an effort to remove all that fishing gear. The neck and the front left flipper were easy to disentangle, but



the materials around the front right flipper were too tight to attempt cutting them at nighttime and with the turtle struggling to return to the sea. Further, it was deemed necessary to examine closely the injuries inflicted because of the entanglement. So, the turtle, named Ariadne, was transported to ARCHELON's field camp, where it was possible to get rid of all fishing gear. The gear removed from the turtle were examined, and two of ARCHELON plastic tags (Jumbo tags, Dalton Ltd., UK) were found, presumably removed from the turtle's flippers during disentanglement. The type of gear removed are used in three different fishing methods: one octopus' jig with four plastic fish lures, one piece of bottom long-line with three hooks, and a section of a static net including the ropes bearing the buoys and the lead weights (Fig. 2). The weight of all entangled gear was approximately 12 kg.



**Figure 2.** Part of fishing gear entangled around the neck and front flippers of Ariadne. The two ARCHELON plastic tags, found in the entanglement, apparently were ripped from the turtle's hind flippers, and possibly caused or worsened the entanglement.

Examination of injuries showed that the entanglement caused only rather superficial cuts to the neck and flippers with the one at the base of the right front flipper being the most severe (Fig. 3). It is possible that the plastic tags placed on the turtle's hind flippers contributed to the entanglement. It is noted that ARCHELON discontinued the use of plastic tags in its tagging programs since 2015 because of the high incidences of them getting entangled in nets (see Nichols et al. 1998).

Ariadne had first been tagged in Rethymno on 27 June 2001 and had a regular history of nesting appearances, all at the same beach sector of Rethymno. In 2012, in the course of a research project, Ariadne was ultra-sounded to check for maturing follicles indicating that the turtle would return to the beach to lay at least one more clutch. She was also equipped with a data logger to collect information on her dive behaviour during the inter-nesting interval (Panagopoulou 2015).



**Figure 3.** The most severe injury was the cut at the base of the front right flipper.

The relatively superficial injuries, combined with the fact that the STRC in Glyfada was almost at full capacity advocated for local treatment. On 14 June, Ariadne was transported to "Cretaquarium" where she was X-rayed to check for the presence of foreign objects such as fishing hooks. The X-rays revealed no findings, and Ariadne was assessed as not in need of any further medical treatment. However, she remained at "Cretaquarium" for further observation under the guidance of AS, in charge of sea turtles at "Cretaquarium", and the late Pavlos Tsaros, then in charge of ARCHELON's STRC in Glyfada.

Finally, Ariadne was released on 26 June 2015 in Missiria, a section of the Rethymno nesting beach, close to where she had been found. Before being released, she was newly tagged, this time with metal tags in the front flippers. On the occasion of Ariadne's release, an impressive public outreach event was organized (Fig. 4) receiving great coverage in the media.





**Figure 4.** Preparations for the release of Ariadne at Missiria beach, Rethymno.

However, a certain point remained unclear. What happened to the clutch of eggs that Ariadne repeatedly tried to lay before her rescue? Certainly, they were not aborted at the Aquarium pool, similar to another case reported from 2000 (Panagopoulou & Margaritoulis 2024) as this was checked daily. SD took measurements and photos of Ariadne's tracks at her release, and these were distributed to volunteers conducting the morning beach survey during the following days. An emergence track that matched these specifications was recorded on 28 June, very close to the release site. This time, the emergence resulted in a nest, with the top egg found at 19 cm below the sand surface. Despite not having tangible proof, it is probable that Ariadne had managed to lay her clutch.

Interaction with fisheries is a major at-sea threat for sea turtles (Margaritoulis et al. 2007, Casale et al. 2018). Especially on Crete, based on small scale fishermen's accounts, the significant decline in fish stocks has led to the increase of the total fishing effort (i.e., more gear used, increased soaking duration, expanded fishing grounds) which increases the probability of sea turtles being accidentally captured, a trend which is reflected in the number of turtles reported dead or injured in Greece (Panagopoulou et al. 2017).

On-site treatment of sea turtles, whenever possible, reduces stress levels to the injured animals caused by transport to rehabilitation centres, especially those far away and allows the rehabilitation centres to admit more severe cases, like those bearing head traumas. Further, on-site treatment is a great opportunity to generate local support and publicity. Sea turtles, being a charismatic species, attract the attention and sympathy on the part of the public and become significant agents for the protection of the marine environment.

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