

# The nesting of marine turtles on the coast of Syria

by Max Kasparek

**Abstract:** The entire Syrian Mediterranean coast (193 km) was surveyed for marine turtle nesting in 1991. Significant nesting was found between Latakia and Jablah. The entire Syrian coast is heavily polluted with plastic litter which covers the beaches for many kilometres with a layer of rubbish up to 0.5 m high. The establishment of a protected area on the coast must be accompanied by a solution to the garbage problem.

**Kurzfassung:** Die gesamte syrische Mittelmeerküste (193 km) wurde 1991 untersucht, um eventuelle Niststrände von Meeresschildkröten zu finden. Ein bedeutender Nistplatz wurde zwischen Latakia und Jablah entdeckt. Die gesamte Küste Syriens ist mit Plastikmüll so stark verschmutzt, daß die Strände über Kilometer mit einer bis zu 0,5 m hohen Müll-Schicht bedeckt sind. Die Ausweisung eines Schutzgebietes im Küstenbereich scheint daher nur dann sinnvoll, wenn auch das Müll-Problem gelöst wird.

**Key words:** marine turtles, conservation, endangered species, pollution, marine environment, Mediterranean coast, zoogeography.

## 1. Introduction

Two species of marine turtles regularly nest in the Mediterranean, the Loggerhead Turtle (*Caretta caretta*) and the Green Turtle (*Chelonia mydas*). Both species are listed in the "1990 IUCN Red List of Threatened Animals", the Loggerhead Turtle as "vulnerable", the Green Turtle as "endangered" (IUCN 1990). The populations in the Mediterranean are relatively small compared with others around the world. All known main nesting sites are situated in Greece, Turkey and Cyprus, with smaller sites in Tunisia, Libya, Egypt and Israel (GROOMBRIDGE 1990, KASPAREK 1993).

The Syrian coast is very close to some of the main nesting sites for Loggerhead Turtles and Green Turtles in southern Turkey and on Cyprus, and it was thought that there might be large, unknown nesting populations in Syria (GROOMBRIDGE 1990). As no previous surveys had been made in Syria, the entire Syrian coast was surveyed in June 1991 in order to find out whether nesting of marine turtles occurs there. It is enormously important that all the significant nesting beaches for marine turtles in the Mediterranean are identified in time for steps to be taken to protect them before tourist and/or other development reaches the stage it has at the other known nesting beaches in Turkey, Greece and Cyprus.

## 2. Previous knowledge of marine turtles in Syria

Little information was available on the occurrence of marine turtles along the Syrian coast. LORTET (1883, 1887) reported that Loggerhead Turtles, *Caretta caretta*, were rather common ("très commune") along the coast of Asia Minor and Syria where he said they feed on algae off the rocky shores. GRUVEL (1931) reported turtles off the shores of Syria. GELDIAY (in a pers. comm. to GROOMBRIDGE 1990) reported that marine turtles are rather common along the Syrian coast and that they also nest there. This is in contrast to an old, very experienced fisherman who reported to SELLA (1982) that he did not know about marine

turtle nesting in the 1920's and early 1930's on the Syrian coast. Turtles were frequently captured and exported to Egypt until 1960, some 200-250 per month in that year; far fewer are caught now (LAURENT 1989 in GROOMBRIDGE 1990).

### 3. Survey techniques

The survey was carried out by ground patrols. This was done by walking along the beach and looking for turtle tracks. All patrols were made during the day, preferably in the morning. Patrols at night were not made, as turtles are easily missed at night when they come on to the beach for clutch deposition, but their tracks can easily be seen even a couple of days after emergence.

During the survey, we took into account that the chances of finding a marine turtle track depended on several factors.

- the visibility of a track greatly depends on the texture of the beach. A track is easily visible in wet sand, but hardly visible in dry coarse gravel.
- the visibility of a track greatly depends on the time of the day. This is especially important for partly obliterated, older tracks. The morning and evening sun casts shadows which make the tracks easier to see even from greater distances. At noon, a careful close examination is often required.
- the longevity of a turtle track greatly depends on the type of the beach, e.g. on its substrate, width, human (and other) use, and even on the weather of the region. Loose sand (moving sand dunes!) does not preserve a turtle track for a long time, and even a light breeze will obliterate tracks here. Turtles usually walk a longer distance on a wide beach than on a narrow one, and a long track has a higher chance of being found than a short one. A beach which is heavily used during daytime (for example by tourists) will hardly have any tracks in the evening, whereas a remote beach will. In regions with a lot of wind (sea winds, evening winds, afternoon breeze etc.), tracks will be obliterated more rapidly than in others without regular winds.

The survey was carried out between 20 and 30 June 1991. This is the peak nesting season for marine turtles in the Eastern Mediterranean (see e.g. BARAN & KASPAREK 1989 for Turkey). The entire Syrian coast was checked for sandy beaches; even beaches made up of coarse material were carefully checked for turtle nesting.

The basis of the survey was the 1:300,000 nautical chart edited by the German "Bundesamt für Seeschifffahrt und Hydrographie", Hamburg (Chart 706: Incekum Burnu bis Tripoli) and first published in 1939 with additions and corrections to 1990. Additional information was obtained from chart 709 "Häfen und Ankerplätze an der Küste von Syrien" with some 1:10,000 to 1:50,000 detail maps.

Several short reports and articles on the survey have been published previously in popular magazines (BAUMGART 1991, SCOTT 1991, MARINE TURTLE NEWSLETTER [U.S.A.], 1991 etc.).

### 4. Results

The entire length of the Syrian Mediterranean coast is 193 km. There are four areas with sandy beaches:



**Fig. 1.** Sandy beach near Tartous being developed for tourism.



**Fig. 2.** Beach of Ras el-Basit near the Turkish border. Marine turtle nesting has been recorded in previous years, but no evidence of nesting was found during the survey. Development for tourism has started.

Tab. 1. The four beach sections of the Syrian Mediterranean coast, with the length and number of sea turtle tracks. Tourist and other development: x = modest; xx = medium; xxx = heavy. Physical suitability of the beach: x = less suitable, xx = suitable; xxx = very suitable.

| area                              | length (km) | physical suitability | tourist development | no. of turtle tracks |
|-----------------------------------|-------------|----------------------|---------------------|----------------------|
| Ras el-Basit                      | 8.5         | x                    | xxx                 | 0                    |
| betw. Latakia and Jablah          | 15.5        | xxx                  | x                   | 25                   |
| betw. Tartous and Banias          | 27.0        | x                    | x                   | 0                    |
| betw. Tartous and Lebanese border | 28.5        | xx                   | x                   | 2                    |
| <b>total</b>                      | <b>79.5</b> |                      |                     | <b>27</b>            |

#### 4.1. The coast at Ras el-Basit

The beach extends from Ras el-Basit to Pigeon Island, a small rocky island to the southwest of the Syrian-Turkish border. It consists of coarse-grained, almost black sand. Although looking like basalt, the sand originates from magmatic rocks which extend from the north of Latakia to the Turkish border (see WIRTH 1971: 60). The slope of the beach from the sea is modest and the width of the beach varies between 8 and 30 m. A rocky spur divides the beach into a northern and a southern half. A small stream (which is almost dry during the summer months) runs into the sea on the southern beach section. Cultivated fields and Mediterranean maquis were found to the rear of the beach until a few years ago, but they have now been cleared almost completely for the construction of tourist facilities. These include many camping sites, some hotels, restaurants, kiosks etc. Many tourists stay on the beach all night. Heavy boat traffic was noted off the shore, and these boats tried to attract tourists to take boat tours by noisy, oral advertisements. The coast is heavily polluted with plastic litter. However, the degree of pollution is relatively low compared with other parts of the Syrian coast.

BAUMGART (pers. comm.) found the track of a marine turtle on 21 June 1983. No evidence of sea turtle nesting was found during this survey. Fishermen who were interviewed by us were familiar with marine turtles, but did not know about nesting in the region. Occasional marine turtle nesting may still occur in periods when the number of tourists is low, but the nesting success must be low. Significant nesting can be ruled out.

#### 4.2. The coast between Latakia and Jablah

The beach extends from Latakia to some cliffs approx. 5.0 km north of the village Jablah (Jebble). A stream runs into the sea approx. 3 km southeast of Latakia, thus dividing the beach into a 3.0 km and a 12.5 km long section. The city of Latakia forms the northern border of the beach.

The beach slopes gently from the sea and consists of fine sand. The beach is extremely wide and usually reaches some 200 m. Extensive sand dunes are found to the rear of the beach. As these are mainly rather flat and only sparsely covered with vegetation, a sandy area up to 500 m wide with the general appearance of a sandy desert is found along the coast.



Fig. 3. Marine turtle nesting beach to the south of Latakia.

The northernmost 3 km are used as tourist beach by people from the nearby city of Latakia. Suburbs and newly-constructed houses are found there to the rear of the beach, and there is also a waste disposal site. Agricultural areas form the rear of the beach and the dunes further south.

The entire beach was extremely polluted with plastic garbage, which mostly formed a deep covering on the sand. Judging from the colour and an awful smell, the sea is badly polluted towards Latakia. Some sewage pipes which opened into the sea were noted close to the town.

We found 24 tracks of marine turtles on this beach on 22 June, 1991. None were located in the northernmost 3 km, resulting in a track density of 0.54 tracks/km. All tracks were rather old, with none from the preceding night. Four tracks were false crawls without clutch deposition, 18 resulted in successful egg laying, and two tracks were so obliterated that the situation remained unclear (see Tab. 2). The nests of all the 18 tracks with nests had been raided by predators. No definite identification of the predators could be made. Some groups of stray dogs (up to 8 altogether) and the tracks of many others were seen on the beach, suggesting that these were the culprits. However, the raiding of turtle nests by humans is also highly probable.

A second visit to the beach was made on 25 June, 1991. A 0.5 km long section of the beach was surveyed and 5 turtle tracks were found: three of them were from the preceding night and two of them were older. All nests had again been raided by predators (Tab. 2).

Tab. 2. Marine turtle tracks found on the beach between Latakia and Jablah on 22 and 25 June, 1991. The distances are given in metres.

| track no. | date nests | no. of from sea | distance | notes                                   |
|-----------|------------|-----------------|----------|---|
| 1         | 22.06      | ?               | ?        | very old, almost completely obliterated |
| 2         | 22.06      | 0               | 30       | false crawl                             |
| 3         | 22.06      | 0               | 35       | false crawl                             |
| 4         | 22.06      | 1               | 22       | nest opened by predator                 |
| 5         | 22.06      | 2               | 15       | track very old, nest opened by predator |
| 6         | 22.06      | ?               | ?        | only part of a very old track           |
| 7         | 22.06      | 1               | 19       | nest opened by predator                 |
| 8         | 22.06      | 0               | 15       | false crawl                             |
| 9         | 22.06      | 0               | 12       | false crawl                             |
| 10        | 22.06      | 1               | 14       | nest opened by predator                 |
| 11        | 22.06      | 1               | 16       | nest opened by predator                 |
| 12        | 22.06      | 1               | 9        | nest opened by predator                 |
| 13        | 22.06      | 1               | 10       | nest opened by predator                 |
| 14        | 22.06      | 1               | 11       | nest opened by predator                 |
| 15        | 22.06      | 1               | 10       | nest opened by predator                 |
| 16        | 22.06      | 1               | 22       | nest opened by predator                 |
| 17        | 22.06      | 1               | 10       | nest opened by predator                 |
| 18        | 22.06      | 2               | 11       | both nests opened by predator           |
| 19        | 22.06      | 1               | 23       | nest opened by predator                 |
| 20        | 22.06      | 1               | 9        | nest opened by predator                 |
| 21        | 22.06      | 1               | 10       | nest opened by predator                 |
| 22        | 22.06      | 2               | 8        | both nests opened by predator           |
| 23        | 22.06      | 1               | 27       | nest opened by predator                 |
| 24        | 22.06      | 2               | ?        | both nests opened by predator           |
| 25        | 25.06      | 1               | ?        | fresh track, nest opened by predator    |
| 26        | 25.06      | 1               | ?        | old track, nest opened by predator      |
| 27        | 25.06      | 1               | ?        | fresh track, nest opened by predator    |
| 28        | 25.06      | 1               | ?        | fresh track, nest opened by predator    |
| 29        | 25.06      | 1               | ?        | old track, nest opened by predator      |

A dead Loggerhead Turtle (*Caretta caretta*) was found on the beach during the survey. Its curved carapace length was 0.79 m.

#### 4.3. The coast between Tartous and Banias

The beach extends from Harf as-Salib 4.5 km south of Banias to the northern edge of the town of Tartous. Ras el-Karab and Ras el-Hassan are situated within this beach section. Almost the entire beach consists of coarse-grained sand with large pebbles. The beach is often interrupted by rocky outcrops. It is very narrow and its width does not usually exceed 8 m. Flat beach rocks are frequently found on the splash-line. Sandy areas are found only in a few small bays. However, the sand is coarse-grained even there and is formed from basalt, particularly in the northern parts.

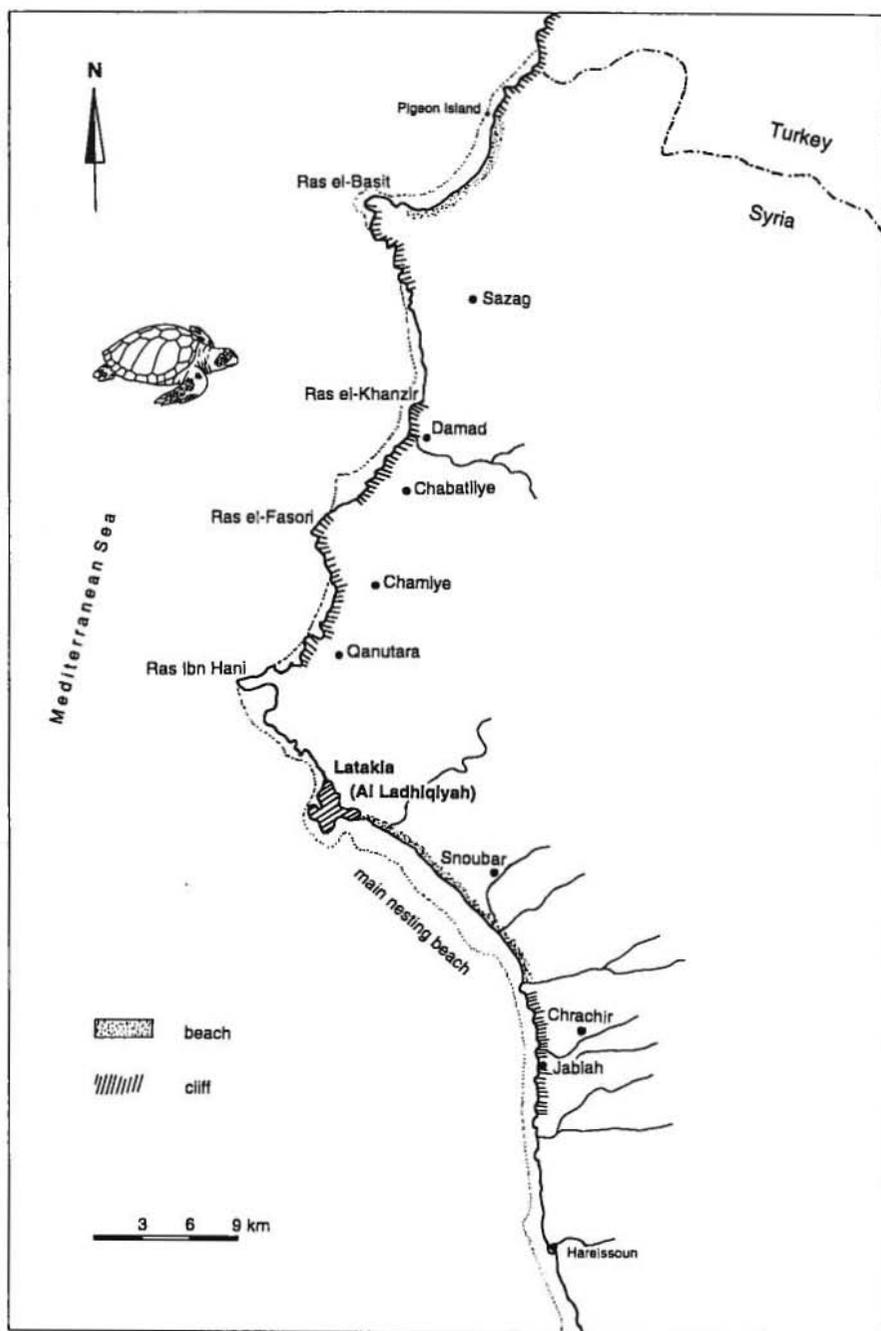


Fig. 4. The northern part of the Mediterranean coast of Syria.

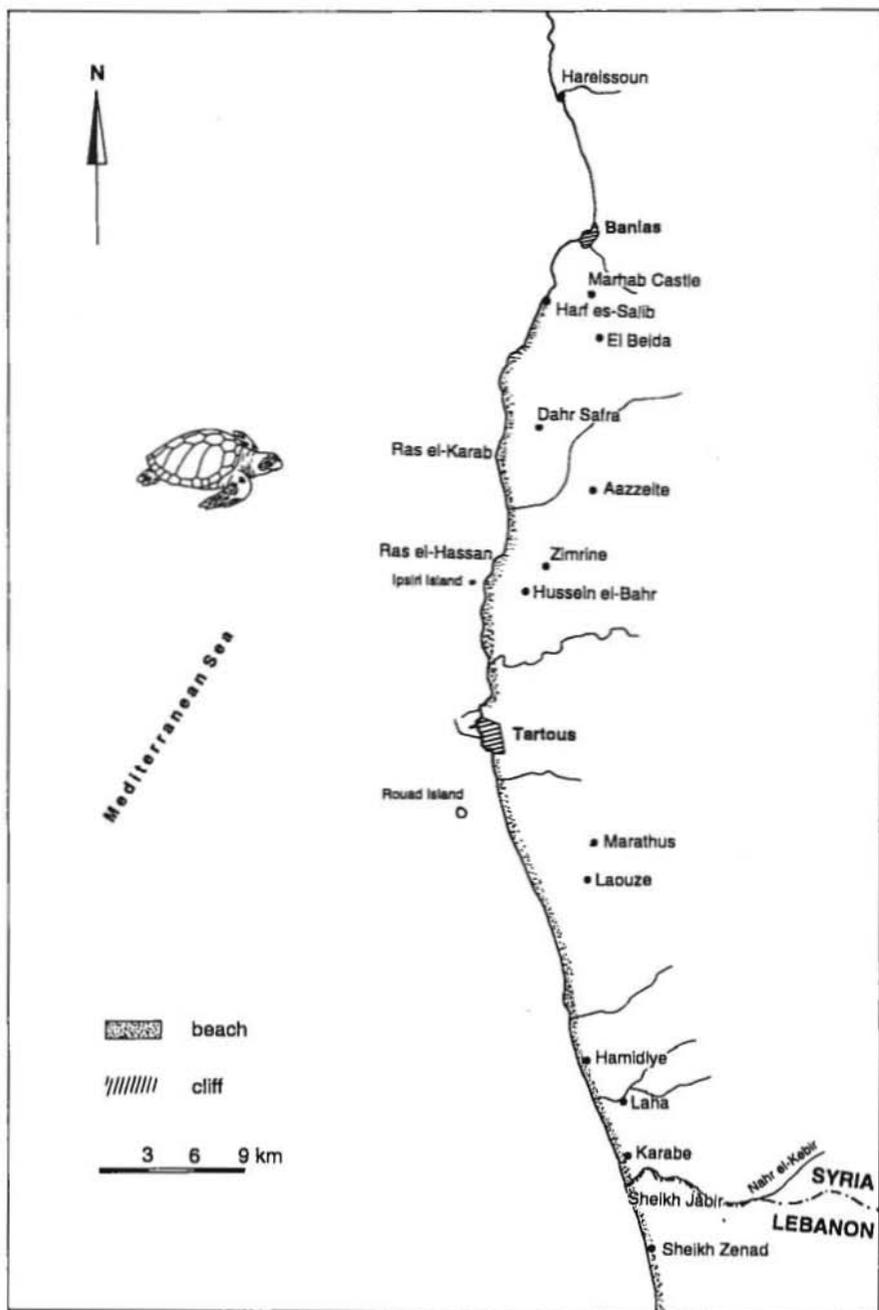


Fig. 5. The southern part of the Mediterranean coast of Syria.

No marine turtle tracks were found on the beach. Even if occasional nesting cannot be ruled out, the numbers are definitively insignificant.

#### **4.4. The coast between Tartous and the Lebanese border**

The beach extends from the southern edges of the town of Tartous in the north to the mouth of Nahr al-Kebir which forms the Syrian-Lebanese border in the south. The beach slopes gently to the sea and consists of fine sand in the north, but large pebbles are intermixed further south. In the north, it is rather wide, but it becomes very narrow further south and is only 4-5 m wide in places. Flat beach rocks are found in many places which cover about 40% of the whole coast. An extensive stone desert is situated to the rear of the beach near the village of Kharabe.

The entire area between Tartous and Hamidiye is used for recreation and many tourists were present on the beach, particularly next to Tartous. The beach has been flattened and widened there with bulldozers. No tourists were seen between Hamidiye and the Lebanese border.

The pollution on the beach is extremely heavy: The whole beach is covered with a layer of plastic litter, up to 30 cm thick at the splash-line. The sea-water was usually dark grey to black near the beach, and floating plastic garbage was present in the areas close to the coast.

Two tracks of marine turtles were found. Both apparently tried unsuccessfully to lay eggs (false crawls). Occasional successful turtle nesting cannot be ruled out. However, the physical structure of the beach is not conducive to turtle nesting in any significant numbers.

### **5. Discussion**

79.5 km of the 193 km long Syrian coast (= 41%) consists of beaches. However, only 15.5 km of these consist of fine sand and are thus suitable for sea turtle nesting. The remaining beaches usually contain too many pebbles and/or are too narrow for significant turtle nesting. Occasional nesting has been confirmed, but the occurrence of significant populations can be ruled out.

The only beach where significant nesting takes place is situated to the south of Latakia: it extends from 3 km south of Latakia to the village of Jablah and is 15.5 km long. 0.54 tracks/km is a rather low nesting density, but another survey a few days later resulted in 5 tracks per 0.5 km. This would give a theoretical 10 tracks/km! Local concentrations of marine turtle tracks are a common phenomenon, but the latter figure may indicate that the figure of 0.54 tracks/km is too low when the whole laying season is taken into consideration. Further studies to assess the degree of importance of this particular beach are therefore urgently required.

It was thought that most of the turtle tracks could be attributed to the Loggerhead Turtle (*Caretta caretta*). However, several of the tracks were rather old and obliterated by wind, and/or the tracks were hardly visible because of the plastic garbage on the beach. A definite identification was therefore not possible in most cases. Follow-up research should include an investigation of whether Green Turtles also nest there.

The most serious and striking environmental problem on the Syrian coast is pollution with plastic litter washed ashore. Plastic litter was seen all along the coast; the shore was covered by a broad belt of plastic litter, and plastics were also seen floating in the sea. All kinds of

bags, bottles, and packaging were seen. There were also upholsteries, the remains of shoe soles, and in particular much medical waste: tubes, syringes and other instruments, all of them apparently used as could be seen by the traces of blood. It was also striking that dead animals, in particular cows and some sheep, were washed on to the shore. From the degree of pollution it was clear that the litter was not the result of one single accident, but that refuse from the towns is systematically dumped in the sea.

There is no doubt that this problem is mainly self-made by Syria. Most of the packaging had writing in Arabic. Many others which did not have Arabic labels are products well-known in Syria, imported from other countries. Nevertheless, it cannot be ruled out that a certain fraction of garbage is washed ashore from other countries such as Cyprus and the Lebanon and from ships in international waters. It is thought that the refuse from some large towns such as Latakia is dumped entirely in the sea; most of the garbage sinks down to the bottom of the sea, but the plastic litter is washed ashore after some time.

Similar problems with plastic litter were found in Southern Turkey at the mouth of the Orontes River: the beach on both sides of the river mouth was extremely polluted with waste and litter during a survey in 1988 (BARAN & KASPAREK 1989). Plastic was scattered over the whole area and even floated in the sea. Some dead cows were seen there, too. The mouth of the Orontes River is only 13 km from the Syrian-Turkish border. It thus seems highly probable that all the garbage was washed ashore from Syria.

The Mediterranean Sea bordering Syria is subject to heavy domestic sewage pollution. In particular around Latakia and Tartous, pipes were seen which discharged sewage directly into the sea. The sea-water had a dark grey to brown colour, and had an odious smell in places.

Plastic litter is a serious problem along the whole of the Syrian coast, which greatly affects development and in particular the development of international tourism. It may also have a direct affect on marine turtles: there is so much plastic litter on the beach that female turtles may have difficulties in finding a suitable place for digging a nest. On the other hand, it may be difficult for hatchlings to struggle through the plastic litter in order to reach the sea.

At present, there is no national legislation to establish nature reserves or similar protected areas. However, Syria has signed the "Barcelona Convention" and a protocol related to that convention, which recommends the establishment of "Specially Protected Areas". Furthermore, the Syrian Government is currently preparing an Environmental Protection Act which will bring their environmental laws into line with modern concepts of conservation and sustainable development (see IUCN Bulletin 3/1993: 21). The Mediterranean coast between Latakia and Jablah may be a suitable pilot project for these new laws.

## **6. Recommendations**

1. To further assess the exact number of marine turtles nesting between Latakia and Jablah, and to identify the species involved.
2. To collect information on predation of the turtle nests, and to take measures for protection against predation.
3. To establish a protected area between Latakia and Jablah. It is important that industrial and/or tourist development should be forbidden.



Fig. 6. Crude oil forming a thin layer on the sandy beach near Lattakia.



Fig. 7. Extreme pollution with plastic litter covers the only important nesting beach of marine turtles in Syria, near Lattakia.

4. To study the sources of the high level of pollution of the sea and of the coast of Syria, and to take steps to stop it. International aid assistance should be offered to the Syrian Government to solve the immense garbage and sewage problems.

#### Acknowledgements

The survey was carried out on behalf of, and thanks to support by, MEDASSET, the Mediterranean Association to Save the Sea Turtles, and the Herpetofauna Conservation International U.K. (HCI). In particular I wish to thank Lily VENIZOS and Keith CORBETT for their continuous support and encouragement. The fieldwork was carried out in collaboration with Dr. W. BAUMGART, Berlin, whose contribution was essential to the success of the study. I am also very grateful to Marina CONTARIS, Gwynedd (U.K.), who checked the English language of the manuscript.

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