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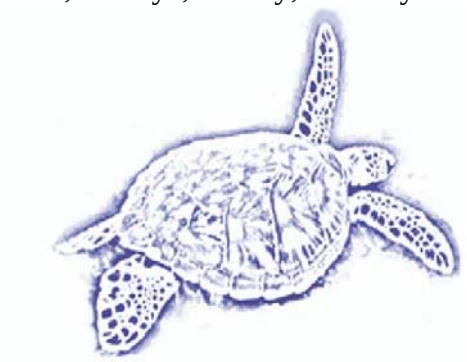
CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE
AND NATURAL HABITATS

The Second Mediterranean Conference on Marine Turtles
Antalya 4-7 May 2005
Mirage Park Resort
http://www.medturtleconf.net

2nd Mediterranean Conference on Marine Turtles

(Kemer, Antalya, Turkey, 4-7 May 2005)



IUCN/SSC Marine Turtle Specialist Group
Mediterranean Region

WWF

Document prepared by
the Directorate of Culture and of Cultural and Natural Heritage

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Highlights of the 2nd Mediterranean Conference

Document submitted by the Scientific and Programme Committee of the Conference

Session 1: Networking and Social Issues

The main points underlined were:

- the importance of public awareness for the sea turtle conservation, in order to avoid threats such as direct consumption of turtles (still occurring in some countries of the Mediterranean) or environmental loss. The awareness must be carried out on all target groups, from local people to national authorities and using the media.
- the importance of recording/studying turtle strandings for assessing threats at sea. In order to improve the actions and studies on strandings, it has been of special relevance the creation and first steps of networking among sea turtle rescue centres in Mediterranean countries. Such a network would let the exchanging of expertise and the sharing of information between members improving the quality of their tasks. In addition, this network can be a good body to influence policy makers, leading to a more efficient conservation of sea turtles in the Mediterranean.

Session 2: Turtles at Sea

- Sea turtles are marine animals spending all life at sea, with just an exceptional, though fundamental, presence at land. However, traditionally most of the research and conservation activity is carried out at land.
- Fortunately, this disequilibrium is rapidly changing, as shown by the number of oral and poster presentations dealing with turtles at sea in this conference. These studies are contributing to understand where, when and how, turtles of different origin go and distribute in the Mediterranean.
- The classic flipper tagging still provides useful insights, though satellite telemetry can clarify aspects otherwise impossible to investigate, and new tracking devices are promising.
- Other studies on turtles-at-sea improve our knowledge on the threats the Mediterranean populations are facing, providing further evidence of the importance of fishery interactions but also on other factors like boat strikes.

Session 3: Nesting Populations

- The improving knowledge is showing that the importance of nesting beach is not only associated with the number of nests. For instance genetics and sex ratios should be taken into consideration.
- There is a need of detailed research for the discovery of new possible nesting sites in the eastern Mediterranean.
- There is a need to protect the already identified nesting sites.

Session 4: Ecology and Ecophysiology

- On sex-ratio and eggs incubation:
  - temporal and spatial sex-ratio variation in the loggerhead nests to be considered during nest relocation activities.
  - concerning the global warming phenomenon, a high conservation priority should be given to the beaches producing a male biased sex-ratio.

- On the physical characteristic of the nesting beaches:
  - Coastal degradation decreases the success of the nesting activity.
- In addition to the classic assessment of the nesting effort, several ecological factors were studied. In the same way the development of stranding networks and sea turtle rescue centres allowed the development of epibiont study and feeding ecology. The stranding studies should be encouraged.

Session 5: Management and Conservation

The session highlighted the following:

- what is conservation and what is not. Monitoring, tagging etc are not conservation measures. Their aims are to provide information on which to base conservation policy and actions. So far conservation measures have focussed mainly on beaches not at sea.
- The need to apply up-to–date knowledge and techniques in turtle conservation projects on nesting beaches, relating *inter alia* to predation, was stressed. It includes issues such as:
  - The use of non-magnetic material for protective cages or grills for protecting nest.
  - Protection nests *in situ* wherever possible (implies that beaches need to be protected).
  - Disturbing nests and hatching process as little as possible during the efforts to protect the nests (no digging for locating chambers, no digging up hatched nests in less than 3 days after hatching).
  - Predator population control.
- The value of training for conservation was emphasized as this would minimize the risks to turtles.
- The progress made in passing legislation protecting and managing critical areas for turtle conservation and more so the willingness in implementing such legislation was reviewed for a number of countries (Cyprus, Malta, Turkey).
- Raising public awareness and education issues were presented and discussed. They were deemed as prerequisites to effective conservation. The channels and modalities used need to be appropriate to target groups.

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The Standing Committee is requested to take note of the report of the Conference, thank the Turkish authorities for the excellent hosting of the meeting and congratulate the Secretariats of the Barcelna and Bonn Conventions, WWF-Turkey and the Head of the Scientific Committee, Mr Dimitris Margaritoulis, for the organisation of the Conference.

Disclaimer :

The designations employed and the presentation of the material in this document do not imply the expression of any opinion whatsoever on the part of the organizations involved in the organization of the Conference concerning the legal status of any State, Territory, city or area, or of its authorities, or concerning the delimitation of their frontiers or boundaries. The views expressed in this volume are those of the authors of each paper and do not necessarily represent the views of the above mentioned organizations.

The ***Second Mediterranean Conference on Marine Turtles*** is a joint initiative by the Secretariats of the following Conventions :

- Convention for the Protection of the Mediterranean Sea against Pollution(Barcelona Convention, 1976)
- Convention on the Conservation of Migratory Species of Wild Animals (BonnConvention, 1979)
- Convention on the Conservation of European Wildlife and Natural Habitats(Bern Convention,1982).

The event was organized with the support of the IUCN‘s Marine Turtle Specialist Group (IUCN/MTSG). The hosting organization of the Conference is the Ministry of Environment and Forestry of Turkey, and the local facilitator WWF-Turkey.

ORGANISING COMMITTEE	**Aybars ALTIPARMAK (Ministry of Environment and Forestry)** **Marco BARBIERI (Bonn Convention)** **Eladio FERNANDEZ-GALIANO (Bern Convention)** **Dimitris MARGARITOULIS (Regional Chair of the IUCN's MTSG)** **Atef OUERGHI (RAC/SPA, Barcelona Convention)**
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Acknowledgements :

The Organising Committee would like to thank the members of the Programme Committee for the work devoted to the successful scientific programming of the Conference and to the abstract reviewing, and also the personnel of WWF-Turkey

FOREWORD

In view of the success of the first conference conducted in Rome in October 2001, the Second Mediterranean Conference on Marine Turtles aims to bring together field biologists, conservationists, government administrators and other professionals from all Mediterranean countries involved in sea turtle research and conservation. The Second Conference was organised by the Barcelona Convention (RAC/SPA), the Bern Convention, the Bonn Convention (CMS), the Ministry of Environment and Forestry (Turkey), the IUCN's Marine Turtle Specialist Group (Mediterranean Region) and WWF-Turkey, which acted as local facilitator.

The Second Conference will present the most recent scientific findings and developments associated with sea turtle research, management and conservation aspects in the Mediterranean region, emphasizing the value of regional cooperation. This synthesis, in combination with the integration of environmental information with economic and social aspects, is a prerequisite for adopting sustainable solutions to the numerous contemporary problems.

The general subject of the Conference is: Biology and conservation of marine turtles in the Mediterranean. The Scientific & Programme Committee has classified the submitted abstracts in five thematic sessions (Networking and Social Issues; Turtles at Sea; Nesting Populations; Ecology and Ecophysiology; Management and Conservation). Several key-note presentations, four Workshops, a guided discussion on green turtles, and three side-meetings are also scheduled.

I. INTRODUCTORY SPEECHES

THE ROLE OF THE CONVENTION ON MIGRATORY SPECIES (CMS) IN THE CONSERVATION OF MARINE TURTLES

Marco BARBIERI

UNEP/CMS Secretariat, Bonn, Germany

The Convention on Migratory Species (also known as CMS or the Bonn Convention) is an intergovernmental treaty aiming at the conservation of migratory species that cross national jurisdictional boundaries in the course of their migration. The conservation of marine turtles has a prominent role within CMS. The Convention contains strict measures for the protection of marine turtles at the national level. CMS Parties that are Range States to marine turtles are to endeavour to conserve their habitats, to counteract factors impeding their migration, and to control other factors that might endanger them. Above all, Parties are obliged to prohibit the taking of these species, with few possibilities for exceptions.

The Convention also encourages regional co-operation through specialized Agreements. These may range from legally-binding treaties to less formal memoranda of understanding. CMS Agreements provide for co-ordinated species conservation and management plans; conservation and restoration of habitat; control of factors impeding migration; co-operative research and monitoring; and public education and exchange of information among participating countries.

The Memorandum of Understanding on the Conservation and Management of Marine Turtles and their Habitats of the Indian Ocean and South-East Asia, concluded in July 2000, has a potential membership of at least 40 countries. The contents of a detailed Conservation and Management Plan to accompany the Memorandum were agreed in Manila in June 2001. Twenty States have signed the Memorandum thus far, and it formally took effect on 1 September 2001. A Secretariat for the MOU was established in Bangkok (Thailand) in 2003.

A comparable instrument for Africa --the Memorandum of Understanding concerning Conservation Measures for Marine Turtles of the Atlantic Coast of Africa -- was concluded in Abidjan in May 1999. The first Meeting of Signatory States to the MoU (Nairobi, 2002) finalized a comprehensive conservation and management plan. Nineteen Range States have signed that instrument. Efforts to conserve marine turtles in Africa received a further boost with CMS‘ release of an invaluable information resource, Biogeography and Conservation of Marine Turtles of the Atlantic Coast of Africa, authored by Jacques Fretey.

The Convention on Migratory Species also promotes co-operation through sponsorship of basic research (e.g. surveys of nesting beaches, genetic and satellite-tracking studies to help elucidate migration patterns, assessment of incidental catches), production of information materials

(e.g. identificationposters, and a GIS mapping facility for nesting beaches of the Indian Ocean) and capacity building (e.g. regional training/policy workshops, conservation techniques manual).

Starting at a regional level and focusing in particular on developing countries, CMS is working towards an interlinked, global framework for the conservation of marine turtles. Mediterranean initiatives that make use of all appropriate instruments and tools are best seen in this wider context.

THE BERN CONVENTION AND THE PROTECTION OF MARINE TURTLES IN THE MEDITERRANEAN

Eladio FERNANDEZ-GALIANO

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Council of Europe, Strasbourg, France

The Convention on the Conservation of European Wildlife and Natural Habitats (Bern, 1979) is an international legal instrument aimed to conserve endangered species of flora and fauna and their natural habitats, and encourage co-operation between states.

All the species of marine turtles found in the Mediterranean appear in Appendix II to the Convention, which confers these species full protection (a prohibition of deliberate capture, keeping and killing of individuals or deliberate damaging or destruction of breeding or resting sites) and obliges states to protect their habitats, both breeding beaches or wintering grounds. To date, thirteen Mediterranean states - Albania, Croatia, Cyprus, France, Greece, Italy, Malta, Monaco, Morocco, Slovenia, Spain, Tunisia and Turkey - are contracting parties to the Convention.

The Convention‘s Group of Experts on the Conservation of Amphibians and Reptiles monitors the implementation of the Convention by Parties and submits its recommendations to the ruling body of the Convention, the Standing Committee, which meets annually. In the last 20 years the Convention has issued 11 recommendations on marine turtles (12 % of all adopted).

The Standing Committee may open "files" to states for presumed non-respect of the Convention. Around 10% of files opened by the Convention concern mainly marine turtles (mainly when their nesting beaches are not properly protected). Non-governmental organisations notify cases of noncompliance to the Secretariat, and often exert useful pressure on governments. In the past 15 years the Committee has discussed on sites such as the Akamas Peninsula (Cyprus), Zakynthos (Greece), Kazanli (Turkey) and has devoted much attention to conservation of green turtles.

THE ACTION PLAN FOR THE CONSERVATION OF THE MEDITERRANEAN MARINE TURTLES ADOPTED WITHIN THE FRAMEWORK OF MEDITERRANEAN ACTION PLAN (MAP)

Atef OUERGHI

UNEP/MAP, Regional Activity Centre for Specially Protected Areas
Barcelona Convention Secretariat

There are several international conventions containing provisions for the protection of marine turtles in the Mediterranean region. These conventions are applied to various degrees in the Mediterranean countries with the exception of the Barcelona Convention to which all riparian Mediterranean nations are signatories. The significance of the Barcelona Convention, as far as marine turtles are concerned, is reflected not only in the Protocol concerning specially protected areas and biological diversity in the Mediterranean but also in the elaboration of an Action Plan for the Conservation of the Mediterranean Marine Turtles in 1989 and its recent revision in 1999.

The Revised Action Plan takes a holistic approach to processes threatening Mediterranean turtle populations. Its main objectives are to enhance the population of marine turtles, conserve their critical habitats in the Mediterranean region and to improve scientific knowledge about these species.

After 17 years from its adoption, several questions should be asked. Do we know enough about the marine turtle‘s species in the Mediterranean? Do we know enough about the different populations? Do we know exactly the size of the damage caused by the different fisheries in the Mediterranean? Do we know their migration routes? Do we know the nesting beaches? Are they efficiently protected and managed? Do we exchange really data in the Mediterranean? Data on marine turtles could be compared and analysed to get a regional view of their conservation status?

II. KEY-NOTE PRESENTATIONS

RESEARCH AND CONSERVATION STUDIES ON MARINE TURTLES OF TURKEY

Ibrahim BARAN

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The first nesting records of Caretta caretta and Chelonia mydas in Turkey were reported by Hathaway in 1972. In 1973 Basoglu and in 1982 Basoglu and Baran provided information on the carapace plates of C. caretta measured in Izmir, Koycegiz and Fethiye. Further, Geldiay and his associates described in 1982 marine turtle populations and their protection along the Mediterranean coast of Turkey. In 1988, Baran and Kasparek, with financial support from WWF, conducted the first comprehensive survey of the Turkish Mediterranean coast for turtle nesting sites. During this study, 17 important nesting grounds were identified. Of these, 5 nesting sites were designated as "Specially Protected Areas" by the Turkish Government. Furthermore, a large tourist investment, which would impact the future of marine turtles, was prevented on Dalyan beach. Since 1988, with the financial support of the Ministry of Environment and Forestry, a series of population studies were carried out on selected beaches, and problems affecting the turtles were determined. A total of 71 scientific papers were produced during this time. In addition, 4 PhD students and 14 MSc students completed their thesis on marine turtles.

In recent years, the numbers of nests in the Turkish Mediterranean have been dramatically declined due to destruction of nesting habitats. Fethiye beach where marine turtle monitoring program has been carried out since 1993 without interruption is a good example of such decline. However, this decline can be attributable to two major factors: anthropogenic and natural. The natural factors can be somehow regulated but the accelerated over the last years tourist usage of nesting beaches increases largely the importance of the anthropogenic factors for the conservation of marine turtles. The adverse effects of anthropogenic factors can be decreased by the following precautions.

1. Nesting beaches should be monitored during the breeding season.

2. Sand extraction should be prevented.

3. A special plan should be designated for the education of local people.

4. Information desks should be set up and leaflets on marine turtles and its conservation should bedistributed.

5. Founding of local NGOs should be supported since nature conservation can succeed in the long-term only with the participation of locals.

THE CYPRUS TURTLE CONSERVATION PROJECT œ 29 YEARS ON

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The project started in 1976 with surveys. In 1978 the Lara Turtle Station was set up. The Project evolved with time from a primarily hatchery project, with some head-starting, to a much wider project involving habitat protection, starting in 1989 with the setting up of the Lara/Toxeftra Reserve, with in situ protection of nests and with the implementation of management measures at sea and on the beaches. The Polis/Limni nesting beaches are now also receiving protection. As a long-term project run by the same small team, it resulted not only in an accumulation of data but also of knowledge and experience. This helped in giving weights to the various actions, in clearly defining what is conservation and what is monitoring and research. This also helped in the evolution of conservation techniques and practices, giving priority to conservation over data collection (e.g. disturbance of nest chambers, prior and during hatching, for monitoring or other purposes, types of cages used, etc), in the interpretation of results and in running training courses for building capacity in the Mediterranean. Between 250 and 420 Green and Loggerhead nests are protected every year. Tangible results as to the ultimate success of the project œ to see turtle populations nesting in Cyprus recover œ are more elusive, as other factors get in the picture. There have been signs of change however, in the last 10-15 years, e.g., a large number of juvenile Green turtles, and some sub-adults, are now seen in Cyprus waters, which were never seen before.

CONSERVATION EFFORTS ON MARINE TURTLES IN TURKEY

Filiz DEMIRAYAK

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Marine turtles are fascinating creatures that have lived on the earth for over 100 million years. This remarkable reptile, of which there are seven species, is revered in culture and custom around the world. It symbolises longevity, fertility, strength and protection from the harm. For thousands of years, marine turtles have provided sustenance to coastal communities around the world. Unfortunately, their populations have declined drastically due to unplanned human activities. Economic factors are often behind marine turtle declines.

In Turkey, as elsewhere in the Mediterranean, marine turtles are under serious threat from loss of nesting, breeding and wintering habitats due to beachside urban and unplanned tourism investments, sand extraction and the associated coastal erosion, pollution, by-catch, and collisions with boats. The last report of WWF-Turkey shows that 64% of the 17 most important nesting sites are not adequately protected.

Marine turtle conservation requirements should be included in coastal zone management plans as well as in ecosystem conservation programmes. And we should reduce our footprints on nature.

THE MEDITERRANEAN SEA: A WORLD EXAMPLE OF REGIONAL COOPERATION IN SEA TURTLE RESEARCH AND CONSERVATION

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The Mediterranean Sea is a closed sea featuring a multitude of states, cultures, languages and religions. Although sea turtle research and conservation efforts have started relatively late, in the last few years they have gained a significant momentum. Research has shown that sea turtles know no human boundaries; therefore regional cooperation is a "must" in order to comprehend basic knowledge on their habitats, their life stages, their behaviours and, most importantly, to assess threats and to integrate conservation attempts in regional plans. Examples of regional projects are given and the need to further enhance regional cooperation is discussed.

THE STATE OF THE WORLD'S SEA TURTLES (SWOT) 2004

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The "State of the World's Sea Turtles" Initiative (SWOT) was launched in late 2003, and is now gathering data from dozens of sea turtle researchers worldwide. Founded by Conservation International, the International Sea Turtle Society, the Marine Turtle Specialist Group and Duke University's OBIS-SEAMAP project, SWOT is a long needed effort to create a publicly available, high quality, consensus driven, permanently evolving, global geo-referenced database of nesting beaches, migration routes, and foraging areas for all species of marine turtles. This tool will allow the sea turtle movement as a whole to identify conservation priorities and gaps, readily see global or regional trends in turtle numbers, and the mapped results will be used to engage governments, donors, corporations, and lawmakers.

For SWoT's first year, we have chosen to map all leatherback nesting beaches worldwide with nesting data from the most recent season. To date, more than 75 people and institutions from 35 countries have joined the growing "SWoT Team" by contributing data or providing technical support. In the future, the SWoT report will be expanded to include data on all sea turtle species and at-sea data, such as migratory routes and foraging areas. Advancing a global data sharing initiative of this magnitude presents a serious challenge. This presentation will focus on lessons learned, successes, failures, and future directions for the project, as well as discuss potential applications for the SWoT results; demonstrating how sea turtle researchers and conservationists worldwide can get the most out of the SWoT initiative.

IUCN RED LIST ASSESSMENTS OF MEDITERRANEAN SEA TURTLES: APPLICATION OF GLOBAL CRITERIA ON A REGIONAL SCALE

Jeffrey A. SEMINOFF

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Understanding the status of wildlife species is fundamental to their conservation. For sea turtles, management decisions regarding common themes like bycatch reduction and nesting beach protection as well as more sensitive issues such as sustainable harvest and indigenous use clearly require information on the status of individual populations being impacted. Although few would argue this point, consensus regarding the most appropriate status assessment technique has been elusive. At a global level, the IUCN Red List Programme generates status assessments; identifying a species‘ ”extinction risk‘ based, for example, on past vs. present abundance across its entire geographic range. However, many scientists believe the lack of spatial resolution inherent in global assessments limits our ability to make the best-informed management decisions at local and regional levels. This has resulted in expanded efforts to assess sea turtle populations on the regional scale. Moreover, despite the widespread acceptance of the listings, and its importance in conveying the urgency and scale of conservation problems to the public and policy-makers, Red List Assessments and the implications of their results remain poorly understood. In this presentation, I outline the Red List Assessment procedure and discuss why the issues of spatial and temporal scale are critical. I will describe the assumptions, caveats, and limitations associated with the IUCN Red List Criteria for Widely Distributed Species and discuss the relevant aspects for the Mediterranean regional sea turtle assessments that are currently underway.

CONSERVATION MEASURES ON MARINE TURTLES IN TURKEY

M. Kemal YALINKILIC

Ministry of Environment and Forestry, Ankara, Turkey

The Ministry of Environment and Forestry is designated as the main responsible body for nature conservation and environmental management and charged with co-ordinating all national and international activities in Turkey.

After 1980‘s, the Ministry signed many international conventions related with nature protection. Bern and Barcelona Conventions and the protocols are major ones in species protection area. Within the framework of the Barcelona Convention, following the Genoa declaration, an Action Plan for the conservation of Mediterranean marine turtles was adopted. Marine turtle conservation studies become more active after this Action Plan.

As a result of scientific studies which were carried out in the year of 1988, 17 important nesting sites were selected along the Mediterranean coast of Turkey. These sites were: Ekincik, Dalyan, Dalaman, Fethiye-Calis Kumsali, Patara, Kale, Kumluca, Tekirova, Belek, Kizilot, Demirtas, Gazipasa, Anamur, Goksu Delta, Kazanli, Akyatan and Samandag beach. These sites were legally protected with the Decision of Ministers Commission.

The "Marine Turtle Monitoring and Assessment Commission" was established in 1990 to coordinate overall studies. Three more sites were selected as marine turtle nesting sites: Olympos-Cirali, Alata and Yumurtalik beaches and seven sites including Ekincik, Dalyan, Dalaman, Fethiye, Patara, Belek and Goksu Delta were stated as "Specially Protected Areas".

Yumurtalik beach became a Wildlife Protection Site; Demirtas, Gazipasa, Anamur, Alata, Kazanli, Tekirova, Kale beaches became "First Degree Nature Protection Sites" (SIT); Kumluca, Samandag and Kizilot beaches became "Marine Turtle Conservation Sites".

There had been several excursions to the nesting sites between the years of 1990 and 2000. Several measures and precautions were taken into consideration and the bottlenecks were elaborated. Finally, three commissions on marine turtles, i.e. "Scientific Committee", "National Committee" and "Local Committee", were established with the decision of Marine Turtle Monitoring and Assessment Commission.

In addition, the Ministry focused on designing public awareness campaigns and supporting conservation projects for years.

III. ORAL (O) AND POSTER (P) PRESENTATIONS

SEA TURTLE RESCUE IN TANGIER, MOROCCO (P)

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In the framework of a sea turtle stranding study in Morocco, we recently found (6 May 2004) a small sea turtle Caretta caretta(CCL: 24 cm) polluted by oil on the beach of Sidi Mghait (50 km in the south of Tangier town) in Morocco. A team of researchers from Tetouan Faculty of Science and Ceuta saved this turtle. It was treated during one week by active carbon to wash its stomach and then a week of convalescence by feeding it primarily anchovies and by changing each day its water. Thereafter, we released the turtle in the stranding area to sensitize inhabitants on sea turtle conservation.

AUTOPSY OF A MARINE TURTLE *CARETTA CARETTA*: HISTOLOGICAL STUDY OF SOME ORGANS (P)

Hedia ATTIA EL HILI, Monia EL BOUR, Wassila AYARI, Radhia MRAOUNA,
Naima BEN AMOR

National Institute of Sea Sciences and Technologies, Unit of Aquatic Animal‘s Pathology, str. 2 Mars 1934, 2025 Salammbo, Tunisia

In November 2002, an autopsy of a marine turtle (Caretta caretta) was carried out at the National Institute of Sea Sciences and Technologies in Tunis. The results showed only remains of paperboards not digested in the stomach. On the animal we have taken the necessary measurements and we took tissues of some organs for a preliminary histological study. This stage is very interesting because it allowed us to familiarize us with the structure of healthy tissues.

REPRODUCTIVE ECOLOGY OF *CARETTA CARETTA* AND *CHELONIA MYDAS* DURING 2002 AND 2003 NESTING SEASONS IN ALATA, MERSIN, TURKEY (O)

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We investigated the nesting and hatching success of Caretta caretta and Chelonia mydas during the 2002 and 2003 breeding seasons at Alata Beach, Mersin, Turkey, as being an addition to the 17 principal nesting grounds. A total of 667 and 547 green turtle emergences were recorded in the years of 2002 and 2003 respectively. The numbers of green turtle nests were 134 (20.1 %) in 2002 and 121 (22.2 %) in 2003. The numbers of nests hatched were 127 and 111 for the years respectively. The numbers of loggerhead turtle emergences were 119 and 85 of which 27 (22.7 %) and 32 (37.6 %) were resulted in nests for two consecutive years respectively. All of the loggerhead turtle nests in 2003 and 26 of them in 2002 produced hatchlings. The negative factors affecting the sea turtle population on Alata beach were feral dogs, ghost crab and bird predations and natural causes of embryonic mortalities at different stages. The detailed information about the sea turtle nesting potential of Alata beach, with a total length of 3 km, was first established in this study. Alata beach, by having around 50 sea turtle nests per km per season, is one of the new important nesting grounds mainly for green turtles and less for loggerhead turtles. These results were compared with the other three, designated as important, green turtle nesting areas in Turkey (Kazanli, Samandag, Akyatan) and recommendations were made for the new nesting ground.

INVERTEBRATE INFESTATION ON EGGS OF THE LOGGERHEAD TURTLE *CARETTA CARETTA* AND THE GREEN TURTLE *CHELONIA MYDAS* IN ALATA, TURKEY (P)

Cemil AYMAK(1), Serap Ergene GOZUKARA(1), Yusuf KATILMIS(2), Rasit URHAN(2), Askin Hasan UCAR(1)

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The damage caused by some invertebrates to eggs of loggerhead turtle, Caretta caretta, and the green turtle, Chelonia mydas, was investigated during the summer of 2003 on Alata beach, Turkey. These invertebrates are Pimeliasp. (Tenebrionidae; Coleoptera), Elater sp. (Elateridae; Coleoptera), Myrmeleonidae (Neuroptera), Enchytridae (Oligochaeta), Acari, Scarabaeidae (Coleoptera). The most important effects on loggerhead turtle and green turtle nests were made by Pimelia sp. (Tenebrionidae; Coleoptera).

IMPORTANCE OF MEDIA CO-WORK IN SEA TURTLE CONSERVATION SCHEMES (P)

Devrim BARCAK, Ali Fuat CANBOLAT, Dogan SOZBILEN, Fatih ILHAN

EKAD, Ecological Research Society, Olgunlar Caddesi, No: 36/10 Kocatepe, Ankara, Turkey

Sugozu Beaches are 4 small beaches located in the northeast of the Yumurtalik town (Akkum beach, Sugozu beach, Botas beach and Hollanda beach). The total length of the beaches is 3.4 km. It is determined that (during the 2003 and 2004 nesting seasons) these beaches are very important nesting beaches for green turtles (Chelonia mydas). Media attendance and support for the ST conservation projects are encouraged during the project period. 1 press conference, 1 press meeting, 2 joint field work, and regular press visit activities are conducted during the project period and 6 media bulletin were produced during the same period. Thus, local and national media coverage has been influenced by this particular project during July-August 2004.

CAPTURE OF SEA TURTLES IN THE FISHERIES AROUND TANGIER, MOROCCO (P)

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Moroccan waters support a large fishing industry. This is a preliminary study to evaluate the interaction between fisheries and sea turtles in the fishing zone around Tangier, Morocco. Data sheets and measuring tapes were distributed to fishermen willing to collect information on turtles caught in their fishing gear. Between June 2003 and September 2004, fishermen reported 20 accidental captures of loggerheads primarily during the spring and summer months. The size of turtles captured suggests that most individuals may have been juveniles or sub-adults, supporting results of market surveys around Tangier. More in-depth studies will be underway to evaluate the impact of fisheries along the Atlantic coast of Morocco.

HEAVY BOAT TRAFFIC THREATENS LOGGERHEAD TURTLES IN SOUTH WEST ITALIAN WATERS (O)

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Loggerhead turtles, especially juveniles, are commonly found travelling and foraging along the south west Italian coasts. Interestingly, they tend to accumulate in coastal zones with particularly dense human populations. Over the past 13 years the Stazione Zoologica of Naples (SZN) has built up a local stranding network to assess the human impact on sea turtle survival in the Gulf of Naples and adjacent areas. Initially the number of recovered turtles was low, however, since 1999 a total of 172 dead turtles and 66 alive turtles were delivered to the SZN from the Campanian coast alone. Whenever possible, causes of stranding were identified via visual examination, and, in the case of death, further indications were sought in necropsies. Twenty-four percent of all stranded turtles resulted from interaction with fishing activities, 35.7% of which died. However, of 47 (19.7%) turtles with boat accidents, 89.4% died. Moreover, boat impacts had a strong seasonal occurrence with peak time during the summer, while the fishery bycatch was constant year round. Overlaying turtle recovery sites and data from previous tracking studies with the main shipping routes revealed the hot spots for mortal turtle accidents. Unfortunately, during the summer an immensely high number of ten thousand private boats and yachts cross the sea turtle movements. Our data highlight that the water surface, the obligatory oxygen resource for air-breathing aquatic vertebrates, becomes a dangerous interface between sea turtles and human travellers and thus needs urgent consideration for future protection actions.

EMBRYONIC ANALYSIS CONFIRMS: TRANSPLANTATION SAVED A RARE LOGGERHEAD TURTLE NEST ON THE TYRRHENIAN COAST (P)

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A rare nesting event was observed in the evening of 11 July 2002 when a loggerhead turtle laid eggs on the Tyrrhenian coast, north of Naples. During the following 24 days the occurrence of several summer storms as well as tidal flooding threatened this exceptional nest. We thus transferred the nest, containing 89 eggs, to a more secure and higher location about 50 m from the high water mark. After 68 days, 44 of the eggs, found on the upper layers of the nest, hatched, while the other 45 eggs, found on the lower levels, never opened. The 45 unhatched eggs were examined by microscope in order to determine the approximate stage the eggs had reached in their embryonic development before their death. Five eggs were degenerated and could not be assigned to a developmental stage. Almost half (48.8%) of the embryos died at stage 6, and hence at the time of oviposition, while 16.3% reached stage 7,7% reached stage 10, and 4.7% ceased development at each of stage 9,11, and 12. Only 1 egg contained a fully developed dead hatchling. Since the time course of the developmental stages is well reported, we were able to determine that these unhatched eggs had ceased development before the transplantation. In this paper, we conclude that the unhatched eggs, found at the bottom of the nest, died from natural causes, perhaps from the tidal inundation, but not from the transplantation.

MONITORING OF A LOGGERHEAD SEA TURTLE CARETTA CARETTA IN THE CENTRAL MEDITERRANEAN VIA SATELLITE TELEMETRY (O)

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An adult male loggerhead turtle, Caretta caretta, which was accidentally caught in a bottom trawl in the Gulf of Gabes, Tunisia on 21 January 2001, was then released from Monastir on 25 January and tracked via satellite telemetry until 12 December of the same year. The platform transmitter terminal (ST-18) worked uninterruptedly, until 27 April, to precisely trace the route that the animal took from the Tunisian coasts to Greece. Then, the PTT stopped sending signals for 5 months but then on 22 September it resumed transmitting and indicated the return of the loggerhead sea turtle to the Gulf of Gabes, presumed as a wintering and foraging Mediterranean area for this species, where the turtle stayed, until the transmitter ceased functioning. In the past, the long distance movements of the loggerhead sea turtle (Caretta caretta) between Tunisia and Greece were inferred from incidental catch data. In fact, a high rate of females that had been tagged on nesting beaches along Greece‘s coastlines, were found during the winter in the Gulf of Gabes. This paper presents a mapping of this migration route using satellite telemetry, as well as useful information on migration pattern in connection with sea surface water temperatures.

DIRECT MORTALITY ON MEDITERRANEAN LOGGERHEADS: FIRST RESULTS FROM THE SPANISH SURFACE LONGLINE FISHERY (P)

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The surface logline gears are considered as the most dangerous for the threatened marine turtles. Many Mediterranean countries use this gears targeting different species (mainly swordfish, blue fin tuna and albacore) although information on the direct mortality on marine turtles is very infrequent. A Spanish surface logline fleet from the Mediterranean ports targets swordfish during the whole year in the western Mediterranean Sea. Surface logline fleet also target blue fin tuna, albacore and other species with modified surface logline (main lain length, different hook size, baits, deploying depth,) according the year period, species abundance, market conditions etc. Loggerheads are incidentally captured with all logline types with relative direct mortality related to gear type. An onboard observer program was implemented by the IEO to take direct information from the fisheries, including target and incidental species. Observations from 1999 to 2003 are analysed showing different mortality rates depending of the gear type and year period. We analyse the relative direct mortality by gear type and we discuss the implications for the management and conservation of the marine turtle populations affected by the Spanish surface logline fishery.

THE SPANISH MARINE TURTLE TAGGING PROGRAM: IMPLICATIONS FOR THE SPECIES CONSERVATION (O)

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The Mediterranean region is an important breeding area for the Loggerhead Turtle (Caretta caretta). During the first months of the year a group of loggerheads from the Atlantic populations migrate to the Mediterranean across the Gibraltar Strait. A part of this loggerhead group goes back to the Atlantic at the end of the summer period. Small and medium size immature loggerheads exploit pelagic feeding habitats in both Mediterranean basins but large size individuals are observed in bottom shallow water habitats of the eastern basin and in the north Adriatic. Mature individual in the western Mediterranean are also observed and incidentally captured by the Spanish surface logline fleet fishing for swordfish, blue fin tuna and tuna-like species.

Immature and adult loggerheads from the Mediterranean and North Atlantic populations congregate annually for feeding in a broad area around Balearic Islands. The aggregations occur from spring to late summer. An on board observer program during the fishing period, including turtle tagging, was started by the IEO in the 80‘s. In total, 789 loggerheads were tagged from 1988 to 2000 resultant in 15 recaptures, in both within the Mediterranean as well as in the Atlantic. In this paper we present the tagging results and we discuss the implications of the Atlantic and Mediterranean recaptures from a conservation perspective.

WHAT DO WE REALLY KNOW ABOUT CANID PREDATION IN MARINE TURTLE NESTING SITES IN TURKEY? (O)

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Seventeen beaches in the Turkish Mediterranean coast have been identified, for the protection of loggerhead (Caretta caretta) and green turtles (Chelonia mydas), as Marine Turtle Nesting Site in 1988. Human activities such as sand extraction, light-pollution caused by hotels and tourism complexes, fisheries activities, and poorly assessed tourism investments are generally listed as factors adversely affecting the marine turtle nesting and wintering grounds. Research has shown that predation on the turtle nests by foxes (Vulpes vulpes), jackals (Canis aureus), dogs (Canis familiaris) is a problem that results in decrease in successful nesting and hatchling. However, previous studies on predation being limited in their scope, there is a need to assess the affect of predation on nesting grounds by canid species today. This study reviews the data available on predation of canid species on marine turtle nesting sites since 1988 and then discusses the need for establishing a predation monitoring program in selected Marine Turtle Nesting Sites in the Turkish Mediterranean coast such as Dalyan, Anamur and Akyatan where the Endangered green turtle and Endangered loggerhead are both present.

A NEW GREEN TURTLE (CHELONIA MYDAS) NESTING SITE IN THE MEDITERRANEAN: SUGOZU BEACHES, ADANA (TURKEY) (O)

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Green turtles are one of the two sea turtle species that nest in the Mediterranean coast (Caretta carettaand Chelonia mydas). Green turtles in the Mediterranean nest mainly in Turkey and Cyprus. There are three important nesting areas on the Turkish coastline (Kazanli, Akyatan and Samandag). Sugozu beaches are 4 small beaches located in the northeast of the Yumurtalik town (Akkum beach, Sugozu beach, Botas beach and Hollanda beach). The total length of the beaches is 3.4 km. 213 green turtle nests were determined in Sugozu beaches during the 2004 nesting season. Thus these beaches can be very important nesting sites for green turtles. This study analyses and evaluates the importance of these beaches as green turtle nesting sites in Turkey and in the Mediterranean.

IMPORTANCE OF ACHIEVING PUBLIC AWARENESS AND PARTICIPATION IN SEA TURTLE PROTECTION SCHEMES; CASE STUDY: SUGOZU BEACH (P)

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Sugozu Beaches are 4 small beaches located in the northeast of the Yumurtalik town (Akkum beach, Sugozu beach, Botas beach and Hollanda beach). The total length of the beaches is 3.4 km. It was determined, during the 2003 and 2004 nesting seasons, that these beaches are very important nesting sites for green turtles (Chelonia mydas). Raising public awareness and achieving public participation in sea turtle protection projects took place in the nearby areas to these beaches between August 2003 and December 2004. Local authorities and local communities are included in education seminars, cafe conversations, beach meetings and field activities to inform on and to encourage participation in conservation schemes. During these activities the roles of local authorities and local community members in conservation schemes were discussed and analysed. Participative conservation schemes have been used as a successful model to achieve sustainable sea turtle protection.

EVALUATION OF THE POTENTIAL REASONS BEHIND THE PREMATURE DEATHS OF SEA TURTLES *CHELONIA MYDAS* AND *CARETTA CARETTA* IN KAZANLI BEACH (P)

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A beach monitoring study took place in Kazanli between 15 April 2002 and 15 September 2003 in order to determine the reasons behind the deaths of sea turtles in the area. Moreover, seashore studies took place between 25 November 2002 and 5 April 2003 in the area to determine the relation between fishery and sea turtles. 26 adult turtles were observed dead during these study periods and distribution of these deaths to the individual species (Chelonia mydasand Caretta caretta), mortality rates and the mortality reasons were also determined. Moreover, fishery accidental catch rates were also determined.

DALYAN BEACH AS A SEA TURTLE NESTING SITE DURING THE LAST SIXTEEN YEARS (1988-2003) (P)

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Dalyan beach is the first determined and defined sea turtle nesting beach for Caretta carettain Turkey and it is also one of the first Specially Protected Areas in Turkey. Dalyan beach has been one of the most high profile areas in Turkey in the eyes of public, foreign visitors, media and the central authorities. This study evaluates the development and the changes in protection schemes and the research activities in the area between 19882003.

SEA TURTLE NESTING IN BELEK BEACHES DURING FIVE SEASONS (1999-2003) AND FUTURE POTENTIAL THREATS (P)

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Loggerhead sea turtles (Caretta caretta) in the Mediterranean nest mainly in Greece, Turkey and Cyprus. Belek beach is situated in the east of Antalya and stretches 29.5 km in length. The beach is divided into two main sections: Belek Tourism Area and Belek Specially Protected Area. Annually, 612 to 745 Caretta caretta nests were determined in the area during five nesting seasons (1999-2003). Subsequently, it was determined that this area is strategically important as a nesting area. Therefore, it would not be wrong to claim that the area should be protected. However, more tourist industry development (on the top of what already exists) was planned by the central agencies. Thus, the potential threats to this important nesting site will increase in the future. This study evaluates the relation between tourist industry development and sea turtle nesting in the area as it stands and it projects the future relationship between these two.

GENETIC STRUCTURE OF THE LOGGERHEAD TURTLE (*CARETTA CARETTA*) MEDITERRANEAN NESTING POPULATIONS (O)

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We assessed the genetic structure of the Mediterranean nesting populations of the loggerhead turtle (Caretta caretta) using a mitochondrial DNA marker and seven microsatellites. Genetic structuring was identified with both kind of markers, thus suggesting that both females and males are phylopatric and that gene flow between populations is restricted, although exists for nuclear DNA. This demonstrates that some males mate with females of other populations. Mitochondrial DNA data suggest that the populations nesting on the islands of Crete and Cyprus have suffered a recent bottleneck or have been colonized recently (founder effect). However, no bottleneck or founder effect has been detected with nuclear markers, thus suggesting that male mediated gene flow from other populations highly increases nuclear genetic variability. In this scenario, Crete and Cyprus are thought to play a central role in the male mediated gene flow between Mediterranean populations. Due to these connections, the negative effect of genetic drift or inbreeding on the smallest populations may be less important than suggested by reduced population size.

PASSIVE DRIFT GOVERNS DISPERSAL AND CAUSES GENETIC STRUCTURING OF IMMATURE LOGGERHEAD TURTLES IN THE WESTERN MEDITERRANEAN (P)

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Passive drift, active swimming, or a combination of both, have been proposed as dispersal mechanisms in juvenile sea turtles. The analysis of a mitochondrial DNA marker in loggerhead turtles (Caretta caretta) from eight feeding grounds revealed deep genetic structuring within the Mediterranean, which can be explained by the pattern of sea surface currents. These findings support passive drift as the main mechanism that governs dispersal, although active swimming might also be involved. The populations in the northwestern Mediterranean were almost entirely comprised of individuals from the highly endangered eastern Mediterranean rookeries, whereas individuals from the Atlantic rookeries dominate in southern foraging grounds. Conservation plans should make it a priority to reduce the mortality caused by incidental by-catch in these areas.

POSSIBLE MOVEMENT PATTERNS OF LOGGERHEAD SEA TURTLES (*CARETTA CARETTA*) IN THE MEDITERRANEAN SEA (P)

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The Mediterranean basin is relatively small if compared with oceans, but hosts both oceanic and neritic habitats for loggerhead turtles, and Mediterranean turtles share some foraging areas with Atlantic ones. Fidelity and movement patterns to and between these areas are still unclear. We consider 108 cases of specimens tagged and re-encountered classifying them in fidelity/movement patterns on the basis of size, geographic position, and season at release and at re-encounter. Data show the existence of fidelity not only to neritic habitats but also to oceanic ones. They also show evidence of an opposite "erratic" pattern, in which turtles change area and this change cannot be explained with seasonal or reproductive migration. Turtles showing the two patterns belong to the same size class and we hypothesize that the different patterns are due to different populations and that the erratic turtles might be Atlantic specimens.

THE WWF‘S MARINE TURTLE ACTION PLAN FOR THE MEDITERRANEAN SEA (O)

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WWF International directs its global conservation efforts at three levels: conservation at the eco-regional level, conservation of endangered and other species, and addressing global threats. WWF has chosen to focus its species conservation efforts at the global level on a small group of "flagship" species, and prominent amongst those species, are marine turtles. Marine turtles also act as flagships for important conservation and environmental issues, as well as being charismatic ambassadors for their habitats, marine conservation issues and the lesser-known species which share their ecosystems. WWF is developing regional marine turtle action plans, designed to deliver three major objectives: (1) reduce the loss and degradation of critical habitats, (2) reduce the negative impacts of fisheries by-catch, and (3) reduce unsustainable use and illegal trade of the species and their products. There are two key elements in all WWF‘s marine turtle conservation work, namely, partnerships with a wide range of stakeholders including government, local communities, other NGOs, and academic institutions, and the use of the best available science to guide the work. WWF focuses on marine turtle conservation at all levels: local, regional and global. We are finalizing a new action plan for Marine Turtles in the Mediterranean that focuses on key threats and priority countries for ongoing and new work. It will be shared with key partners for scientific and technical comments, and will be finalized by July 2005. Our presentation will highlight our global and regional work, and highlight the key priorities in our new Mediterranean Action Plan.

1970S IN THE EOLIE ISLANDS: TURTLES FROM SEA TO SAUCEPAN (P)

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Up to the nineteen seventies in the waters surrounding the Eolie Islands loggerhead sea turtles used to be caught by fishermen for food. From January to March nearly 10 rowing boats were used to fish Caretta caretta specimens. Boats and fishermen used to come from the islands of Alicudi, Filicudi, Salina and Stromboli. Every day up to 30 specimens/per boat were caught, mostly by hand and just a small number by net. Turtles were then sold in Salina still alive. Eolie inhabitants used to consider loggerhead as chicken: just a source of protein, cheap, abundant and easy to catch during the winter months, when links with Sicily were missing. Fishermen now remember that turtles were easier to sell when they ranged from 10 to 25 kg, so that was the size they fished for. But they also remember the presence in the sea of turtles of all different sizes. Some leatherbacks Dermochelys coriacea were also seen in these waters, but for some reason no one was inclined to eat them, so this species was never considered a target. Presence of loggerheads during the winter months suggests the hypothesis that the waters surrounding the Eolie Islands are a wintering area. Researches on that are currently in progress.

MULTIPLE PATERNITY IN LOGGERHEAD SEA TURTLE (CARETTA CARETTA) NESTS ON KURIAT ISLAND, TUNISIA (P)

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Loggerhead sea turtles Caretta caretta are listed as threatened species, and measuring many aspects of their biology is necessary to enhance conservation efforts.

In this preliminary study, we attempt a genetic characterization of hatchlings from four loggerhead sea turtles clutches sampled in Kuriat Island (Tunisia), by an allozymic survey at 17 loci. Our results revealed a relatively high genetic heterozygosity ($0.103<H<0.135$) in comparison with previous study on green turtle Chelonia mydas. This could reflect the effective population size in the Mediterranean Sea. On the other hand, the examination of genotypes at the Es-3 locus suggested multiple paternity in three out of four clutches. According to this preliminary finding, multiple paternity seems to be frequent in these clutches and could be an important factor contributing to the relatively high genetic diversity.

SEA TURTLES OF MOROCCO: AN ECOLOGICAL CATALOGUE (P)

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We provide new data on the origin, distribution, abundance, dynamics, ecology and threats of all species of sea turtles present along the almost 2000 km Atlantic and Mediterranean coastline of Morocco (Loggerhead, Leatherback and Green turtle) thanks to a 15-year survey, representing the longest study of this kind. Loggerhead turtle: A developmental area and a possible nesting area in the Atlantic and one feeding area in the Mediterranean, where they feed almost exclusively out of the portunid crab Polybius henslowii. Leatherback turtle: A wintering area at the beginning of the Mediterranean Africa, where they stay at the quite bays and feed out of the gelatinous plankton, appearing here in form of blooms. Alive and dead strandings in the rest of the Mediterranean and in the Atlantic littoral are also recorded. Green turtle: A developmental area and evidence of a nesting area. Further, sightings at-sea, beach surveys, medical rehabilitation, necropsies, anatomo-osteological studies, satellite tracking, etc. were performed and will be presented.

A MASSIVE STRANDING OF SIX LEATHERBACK TURTLES (*DERMOCHELYS CORIACEA*) AT THE WESTERN AFRICAN ALBORAN SEA: CONFIRMATION OF THE MOST IMPORTANT WINTERING AREA FOR THIS SPECIES IN THE MEDITERRANEAN SEA (P)

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We registered the massive stranding of six leatherback turtles on a single beach, at the North West African coast, where the Atlantic Ocean and the Mediterranean Sea meet. These turtles were the last of ten which appeared in November 2004 in less than 20 km of coast. Every turtle was pictured, measured, necropsied and buried, so information about its life stage, pathology, feeding ecology, osteology, etc… could be collected. To complete this information, we explain the fact that every winter and fall, leatherback turtles enter these waters (even in groups) through the Strait of Gibraltar, as confirmed by the numerous sightings and strandings recorded (even another massive stranding of three individuals occurred in the 80s). A proper explanation of these phenomena is given in this presentation confirming that this coast is the most important wintering area for leatherback turtles in the Mediterranean Sea.

A REVIEW OF SEA TURTLE CONSERVATION IN TURKEY (O)

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The Mediterranean coast of southern Turkey supports several internationally important breeding beaches for Caretta caretta and Chelonia mydas. MEDASSET, with a natural interest in the biology and conservation of marine turtles, and with observer status at the annual Contracting Parties meetings of the Bern Convention Standing Committee, has prepared reports, highlighted threats and made proposals regarding sites in Turkey, such as Patara, Kazanli, Belek and Dalyan. In particular, MEDASSET, with the support of the Societas Europaea Herpetologica, has highlighted the critically endangered status of Chelonia mydas, lobbying for case files to be opened at the Bern Convention and formal recommendations to be made to the Turkish Government. This paper reviews the last 17 years of marine turtle conservation issues in Turkey. Threats to important turtle rookeries have been numerous and have included major tourist developments, disturbance, pollution, sand extraction and erosion. A timeline of major events at specific sites provides a summary of MEDASSET's activities, since its inception in 1988, in response to these threats. A literature review lists major documents and other publications relevant to turtle conservation in Turkey. In this way, the successes and failures in preventing damaging developments and addressing specific problems via the Bern Convention, as well as promoting turtle conservation and local awareness, are assessed. Where possible, the breeding success of marine turtles in Turkey, and how this has been affected, is also reported.

REHABILITATION OF INJURED SEA TURTLES IN LAMPEDUSA WWF RESCUE CENTER (O)

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The main pathologies that our surgery has to face regard Caretta carettawhich are victims of the fishing habits related to Lampedusa. When swordfish fishing takes place, often hooks penetrate the gastro-enteric system of turtles, but also their eyes and flippers. Many more parts of the turtles‘ body are exposed to damage when fishing is carried out by trawl nets. Also the long tourist season of the island causes damages and wounds, mostly due to pollution or to speedboat strikes. Our Rescue Center plays a social and cultural role to awaken public opinion to environmental problems. Actually, because of a growing cooperation, many fishermen are now used to bring us the turtles found in their gear. If the hooks are easily reachable, extractions are carried out immediately by hands. Otherwise the turtles undergo an operation at the Rescue Center, after various clinical exams and then to reconstructions and sutures. Our Center is developing and testing a new surgical technique called "rear breach" that means to reach the intestine area by opening a "breach" at the juncture of one of the rear flippers. During their convalescence, the turtles are treated with antibiotics and they are continuously monitored because of the importance of some parameters. When their conditions are the best, the turtles are released after tagging. The autopsy is always a practice in case of dead turtles to reveal death cause. Data collected in the years 2000-2004 are presented by diagrams.

ASSESSMENT OF THE UTILITY OF USING GEOLOCATION LIGHT LOGGERS TO INDICATE MOVEMENTS IN MEDITERRANEAN SEA TURTLES (O)

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Marine turtles range across entire ocean basins which has led to large gaps in our knowledge of their at sea life. This paucity of knowledge has lead to the utilisation of a number of techniques to gather information on the movements of marine turtles. These techniques range from low-tech methods, such as mark and recapture using flipper tags through to expensive, satellite telemetry. Here we report the first use of geolocation by light, using relatively inexpensive GLS units (Global Location Sensing) in order to estimate the positions of marine turtles in the Mediterranean. To ascertain the accuracy of these devices in the study of marine turtles we attached both satellite transmitters and GLS units to remigrant green turtle (Chelonia mydas) and loggerhead turtles (Caretta caretta). During each subsequent nesting attempt data loggers were retrieved, data downloaded and new units redeployed. A total of 28 GLS units were recovered from 12 different individual (3 loggerhead turtles and 9 green turtles). When comparing the mean satellite positions with the mean GLS locations we attained a GLS accuracy of 50.3 km for green turtles and 57.6 km for loggerhead turtles. From this study that the estimation of location using GLS technology offers real utility when ascertaining sea turtle movements, migratory pathways and over-wintering or foraging sites.

ABSOLUTE ABUNDANCE OF LOGGERHEAD SEA TURTLES IN SPANISH MEDITERRANEAN AND ITS CONSERVATIONAL IMPLICATIONS (P)

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Between 2001 and 2003 we performed seasonal aerial surveys in the central Spanish Mediterranean waters, following the transect line methodology, in order to determine the absolute abundance of loggerhead turtles. We surveyed a total of 16,996 km, recording 770 turtle sightings during sampling effort. We used the program Distance 4.0 to estimate overall and seasonal changes in abundance of turtles. Loggerhead turtles were present in the area with a high abundance all year around, with densities varying from 0.05 to

0.43 turtles/km^2, depending on the survey. The average density of turtles in the whole study area was 0.21 turtles/km^2 (95%CI: 0.17 - 0.25) and the mean abundance was 6,653 turtles (95%CI:5,514œ8,027). This result represents only the abundance of turtles at surface because observers cannot detect diving

turtles. In the Balearic Sea, a recent study estimates that the mean proportion of time that loggerhead turtles spent at surface is 35.1%. We use this value in order to correct our estimates, obtaining an absolute density of 0.59 turtles/km^2 (95%CI: 0.21-1.68) and an absolute abundance of 18,954 turtles (95%CI:6,679œ53,786). Other studies have estimated that the Spanish long line fishery captures accidentally around 20,000 loggerhead turtles per year. Although this data is not updated, our estimates seem to indicate that western Mediterranean loggerhead stocks hardly can bear such numbers of captures. Conservation measures must be implemented in order to reduce the number of turtles captured.

MARINE TURTLES NESTING ACTIVITY IN LIBYA: NEW RECORDS OF NESTING SITES IN THE EASTERN LIBYAN COAST (P)

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Marine turtle nesting sites in Libya, with the exception of the Kouf National Park, have remained unknown for a long time. To assess nesting activity along the Libyan shores, a project made of three nesting activity surveys were conducted respectively in 1995, 1996 and 1998, between the Egyptian and the Tunisian borders. 81 sites and 333.65 km of beaches were sampled representing 29.17% of the total sandy shore length in Libya. A total of 415 turtle tracks were recorded in the three phases of which 210 were identified as nests. In July and August 2004, a coastline portion of 210 km was prospected and 26 km of sandy beaches were sampled in the eastern part of Libya from Tolmetha to Tubruq. Eight beaches were identified as new nesting sites (Tolmetha, Ras-Elhabon, Elhasi, El-Koria, Edes1, Edes2, Kashem-Elkalib and Musrata Aman). 15 loggerhead tracks were recorded, of which 8 resulted in nests. Turtle track densities, during the four project phases, ranged from zero to 5.8 nests/km. In comparison with the neighbouring countries, turtle nesting activity in Libya is assessed as high. This could be explained by the presence in Libya of large sandy beaches that are still conserving their natural condition. In this note we try to analyse our knowledge on the loggerhead nesting activity in Libya.

CONSERVATION PROJECT OF SEA TURTLES IN PATOK (ALBANIA) (P)

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During the period 2002 - 2004 we have studied 382 individuals of Loggerhead turtle (Caretta caretta) and 8 individuals of Green turtle (Chelonia mydas), caught in fishing gear. Most of the turtles were caught at the fishing area of Patok, and few at the fishing areas of Durres and Divjaka. From the 382 individuals, 12 were dead (all C. caretta), 3 had a posterior flipper missing and 4 had a hook in their esophagus. We have tagged 234 turtles: 2 C. carettain 2002, 196 C. carettaand 2 C. mydas in 2003, 31 C. carettaand 3 C. mydasin 2004. All sea turtles observed were carrying various epibionts (Algae, Crustacea, Isopoda, Mollusca). Further, in the context of the project, we have undertaken activities aiming to raise the level of education and awareness of fishermen and other stakeholders regarding the protection and preservation of sea turtles.

NEW SATELLITE RELAY DATA LOGGERS REVEAL FLEXIBLE DIVING STRATEGIES OF LOGGERHEAD TURTLES (O)

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While we are only beginning to understand sea turtle migration routes in the Mediterranean, we are still far from knowing their behaviour outside the nesting season. Recent work using satellite transmitters revealed sea turtle behaviour after they leave the nesting beaches and during the overwintering period. However, information on diving behaviour was usually derived from measuring the intervals that the transmitter was immersed or from depth histograms. We used a new Satellite Relay Data Logger (SRDL) on a 52 kg loggerhead turtle (Caretta caretta) to investigate its depth utilisation in the open sea and also to determine the duration of dormant winter dives. The SRDL functioned for 201 days recording a total of 1952 dives while the turtle moved along the southwestern coast of Italy, crossed the Ionian Sea, and finally arrived at its overwintering ground in the South of the Peloponnese peninsula (Greece). Some turtles have previously been shown circling in the Ionian Sea, probably feeding. This is supported by our new data showing that diving activity in the Ionian Sea was strongly diurnal with repeated long dives to depths between 30 and 60 m. During winter quiescence we obtained the first records of up to 7 hours long dives. Calculations of available oxygen stores and metabolic rates suggest different diving strategies where the turtle may have become anaerobic during deep foraging dives but remained aerobic throughout the winter dormancy.

PRELIMINARY FINDINGS ON THE INTERACTION BETWEEN MARINE TURTLES AND FISHERIES IN SYRIA (P)

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Nesting beach surveys in 2004 confirmed Syria to host a regionally important nesting beach for the critically endangered Mediterranean green turtle (Chelonia mydas) on a beach to the south of Lattakia city. During these surveys, numerous turtle strandings were recorded on the beach and live loggerhead turtles were observed feeding on fish waste from a trawl boat in Al Azhari port. A project was initiated to assess the level of interaction between marine turtles and fisheries in Syria; a possible cause of the strandings and cause for concern at the association of loggerheads with a fishing port.

The on-going project involves interviews with many fishermen, quantification of the fishing fleet in several key ports, tagging, measuring and release of live captured turtles and weekly recording of stranded turtles over a sample region of the Syrian coast. The paper will present data on the tagged and released turtles, strandings recorded and results of the interviews, including the finding that the fishermen consume turtle blood for perceived medicinal purposes.

NESTING ACTIVITY OF THE LOGGERHEAD TURTLE CARETTA CARETTA IN TUNISIA (P)

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The loggerhead turtle Caretta carettais the most frequently found marine turtle in Tunisian waters. This species is common and reproduces on some beaches. The Kuriat Islands (Great and Small Kuriat) represent the most important nesting site in Tunisia. With the aim of conservation, the beaches of both islands have been monitored since 1997 to enumerate and protect nests, females and hatchlings and to determine some reproductive parameters. The hatching and emergence rates, after eight years of monitoring in Great Kuriat, are respectively 70.73% and 68.52%, showing that beaches are suitable for nesting activity. These last results, the relative high number of nests in 2004 (21 nests), never recorded before, and the resurgence of the nesting phenomenon on some sites, declined during the last few years like in Small Kuriat and Chebba, confirm Tunisia‘s conservation effort.

NEST TEMPERATURES AND SEX RATIO VARIATIONS AMONG THE HATCHLINGS AND EMBRYOS OF LOGGERHEAD TURTLES ON DALAMAN BEACH, TURKEY (O)

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The sex ratio of dead hatchlings and embryos were determined by gonads observation and sex ratios for the other hatchlings were estimated by measuring temperatures of the relocated and in situ nests on Dalaman beach during 2002-2004. By analyzing the nest temperatures during the middle third of the incubation period, the mean temperatures during this period were ranged from 28.4 to 31.9 ºC. The sex ratios were estimated between 46% and 95% with a mean of 76% females by using the temperature data. The mean sex ratios were obtained as 85% females (n=190) by histological examination of the gonads of dead hatchlings and embryos. The majority of the embryonic mortalities were found at early (6-7) and late (>26) stages. When these embryonic mortalities were compared in terms of depths, the highest percentages (45%) were found at middle levels and bottoms (35%) of the nests and less (20 %) mortalities at top levels. When the sex ratio of dead hatchlings and embryos compared between the different levels, a 94% female sex ratio obtained at the top level but only 64 % at the mid and bottom levels. The temporal and spatial sex ratio variations were also studied.

THE NESTING POPULATION AND SPATIAL DISTRIBUTION OF LOGGERHEAD SEA TURTLE NESTS ON DALAMAN BEACH, TURKEY (P)

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The nesting activities of loggerhead turtles were recorded on Dalaman beach, one of the main nesting grounds in Turkey during three years (2002-2004). The numbers of nests per year were 103, 110 and 112 respectively. A total of 37 females were tagged. The distribution and fate of the nests together with hatching success were investigated and the locations of nests were marked on maps together with beach-back structures. The reasons of the dense nests and low nesting zones were investigated. The sand blockage of breakwater, beach rocks, photo pollutions from hotels and airport and water sports were found to be the main reasons for low nesting percentages. The incubation period of nests varied between 49 and 67 days. The hatching success was 65 % in the first year and this was increased to 71 and 78 % in the second and third year by relocating and screening the nests. The main reasons for low hatching success were nest predation and embryonic mortalities due to different reasons. In order to reduce these embryonic mortalities, the screening of nests against predation, and the relocation of nests under risk of inundation to the safer zones were suggested. Other factors affecting the low hatching success in the nests closer to the vegetation were invertebrate infestation of nests.

MARINE TURTLE NESTING IN LEBANON (O)

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A complete re-survey of the Lebanese Mediterranean coast was conducted in 2004, aiming both at assessing the current status of coastal habitats and the nesting potential for marine turtles. Sandy beaches in southern Lebanon tend to be longer, while the beaches in the other parts of the country are mostly relatively short and narrow. This factor together with tourist and other development means that the overall nesting potential for marine turtles is mostly in the south. Nesting status on Palm Island off Tripoli remains to be re-assessed. El-Mansouri beach in southern Lebanon, which has been monitored yearly by MEDASSET since 2001, is the most important nesting beach in the country. During the 2004 survey it was found that significant nesting also occurs at El-Aabbassiye/ El-Bourgheliye beach, which is the only beach in Lebanon with significant sand dunes. Marine turtle nesting included nine nests of the critically endangered green turtle (Chelonia mydas). In the Tyre Coast Nature Reserve nine loggerhead (Caretta caretta) nests were found. The 2004 project in Lebanon was a joint effort by the Lebanese Ministry of Environment, MEDASSET, MedWetCoast and the EU funded MSC project. It included awareness building amongst the local population who use the beaches for recreation. Future conservation efforts should include the El-Aabbassiye/ El-Bourgheliye beach and should cover the marine turtle nesting grounds and also rehabilitation of rare and endangered coastal habitats.

MARINE TURTLE NESTING AT EL MANSOURI, SOUTH LEBANON (O)

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El Mansouri beach, located along the Southern coast of Lebanon, is the main nesting ground for Caretta caretta (Cc) and the critically endangered Mediterranean Chelonia mydas (Cm) in the country. The monitoring programme started four years ago by the MEDASSET Lebanese Representative. Since then, the beach has been regularly monitored by MEDASSET. The present study covers the 1st May to the 30th September 2004 nesting and hatching season, aiming to update information on the status of this important nesting site and to compare results with findings of the previous two years. The most frequent species found was Cc with 43 nests (87.8 %), followed by Cm with 6 nests (12.2 %). Spatial distribution of nests varied along the beach from year to year. Nest density along the total length of the beach (1.4 km) was of 30.7 nests/km for Cc and 4.3 nests/km for Cm. Total emergences averaged 43.9 % for Cc nests and 50 % for Cm. Conservation strategies such as nest relocation (N=6) to avoid inundation and individual nest protection (N=49), were applied. No nests were attacked by predators during the incubation period. The hatching success of nests in situ for Cc was 67.2% (N=37;range 0-95.1), whereas 69.2% was recorded for Cm (N=5; range 51.8 - 84). Priority should be given to including this beach in the list of national protected areas in order to control future tourism development and fishing activities.

SEXING OF JUVENILE LOGGERHEAD SEA TURTLES (*CARETTA CARETTA*): GONADAL MORPHOLOGY VS. HISTOLOGY (P)

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Sea turtles exhibit sexual dimorphism only as adults, hence diagnosing the sex of hatchlings and juveniles request employment of different direct and indirect techniques which differ in the level of accuracy. With this study we therefore re-examined sex determination based upon gross morphology of reproductive organs of 99 juvenile loggerhead turtles with the curved carapace length (CCL) ranging from 24.0-69.0 cm (mean:41.8cm;SD:10.3) from the central and eastern Mediterranean by histological analysis of gonads. All the cases where the observer was unable to diagnose the sex from gross morphology of gonads or whereas the sex determination differed between these two methods were classified as the incorrectly diagnosed sex. Overall, the sex was correctly diagnosed in 92.9% of the 99 cases. The highest error rate (33.3%) was found in juveniles with CCL=20.0-29.9cm (N=9), which strongly influenced the sex ratio estimates (visual=0.60; histology=2.00). In turtles with CCL=30.0-39.9 cm (N=38) and 40.0-49.9

cm (N=30), the error rates were 5.3 and 6.7%, respectively, and have not resulted in a significant difference in sex ratios between the methods. In large immatures (CCL= 50.0-69.9 cm,N=22), sex determination equalled 100% by both methods. Our results show that gonadal morphology is good as a sexing method in larger juveniles; however in juveniles with CCL< 30 cm we strongly recommend verification of the results by histological examination of gonads.

HIGHLY FEMALE BIASED SEX RATIO IN LOGGERHEAD SEA TURTLE HATCHLINGS ESTIMATED FROM INCUBATION DURATION ALONG THE ISRAELI COASTLINE(P)

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The Israeli National Nature & Parks Authority recorded nesting data of the loggerhead turtle Caretta caretta along the 190 km of Israel coastline over 9 full seasons (1986-2004). The method used to estimate the hatchlings sex ratio was through calculation of incubation duration and application of our data into concluded results of other localities. The validity of the results is therefore considered as an approximation. Long and short incubation durations imply low and high nest temperatures, respectively. In turtle species whose sex is determined by temperature males are produced at low temperatures and females at high temperatures. The results suggested that the hatchlings sex ratio is approximately 1:1.4 male to female (22.77:77.23). This female-biased sex ratio in Israel is similar to the one previously found for loggerheads in Cyprus. Male hatchlings are more likely to be produced from clutches laid at the beginning (May and June) and at the end (August) of the season, but due to small nesting activity in the beginning and end of season, the number of males is relatively small.

THE JST: AN ADJUSTABLE BUOYANCY AID FOR SEA TURTLES (P)

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Sea turtles are often brought to rehabilitation facilities with buoyancy disorders that result from excessive gas in the gastrointestinal tract, traumatic injury to the lungs or morphological malformations. This condition may be temporary or chronic and requires prompt therapy. Weight belts are commonly used during veterinary treatment but they have some serious limitations. We developed a prototype of an adjustable buoyancy jacket for sea turtles (JST) to solve these problems. Four inflatable air chambers and six weighting pockets guarantee the equilibration of the turtle in the water column. Two adjustable shoulder straps and a belt allow the jacket to be adjusted and fit to different sized specimens. The JST was tested at the Stazione Zoologica of Naples (Italy) on a loggerhead turtle which floated vertically with the caudal part of its carapace above the surface. This animal was not responsive to other remedies and had drastically reduced its food intake and excretion rate. Initially the jacket was inflated anteriorly to keep the animal in a horizontal position. After few hours, the air chambers were deflated until the turtle was able to

submerge again. No signs of stress were noticed, this specimen was able to rest on the bottom and swim normally in a horizontal stable position. The food intake and excretion rate normalised with time. Therefore the JST proved to be very useful in improving the life conditions of sea turtles with chronic posture problems. In the future we will test the JST for the treatment of temporary buoyancy disorders.

LOGGERHEAD NESTING IN RETHYMNO, ISLAND OF CRETE, GREECE: FIFTEEN-YEAR NESTING DATA (1990-2004) INDICATE A DECLINING POPULATION (P)

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Rethymno beach is located along the northern coast of Crete, to the east of the town of Rethymno. The beach is 10.8 km long and divided in several sections which differentiate strongly in physical features and development. Loggerhead nesting in Rethymno was first noted during an elementary survey of Cretan beaches in 1989. In 1990 the area has been included in the standardized monitoring work of ARCHELON and since then it is unfailingly monitored every nesting season. The annual number of clutches laid during a 15-year period (1990-2004) ranged from 248 to 516 nests (range of nesting density: 23.0-47.8 nests/km/season); therefore the area was classified among the "major" nesting sites of Greece. Annual nesting numbers in Rethymno exhibit a downward trend and this is mainly attributed to substantial tourist development, beach use by people and inundation of nests by the sea. An effort is currently made to mitigate these threats.

EXAMINING THE SMALL SCALE EFFECT OF SPATIAL HETEROGENEITY ON THE NESTING BEACHES FOR SEA TURTLE POPULATIONS; A MODELLING APPROACH (O)

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As result of the sharp tourist development habitat alteration, fragmentation and habitat reduction are observed at several beaches. On the other hand, modification of the structure of the beaches as a result of extensive tourist services has further altered significantly these coastal ecosystems. In the present study we developed a simple theoretical tool that could provide some basic information on the effectiveness of conservation measures applied at the nesting beaches of sea turtles. Using a spatial simulation model we studied the impact of increased heterogeneity and dynamic changes of the nesting sites on the breeding activity of sea turtles. The effects of the reduction of the suitable nesting area and the changes at beach structure and furniture upon nesting success are examined and assessed. We developed a stochastic movement rule model for describing individual behaviour of nesting sea turtles. With respect to the spatial distribution and dispersal of material found at the nesting sites, we examined the proportion of the failed nesting attempts. A series of simulations were performed, while additional changes in the size and distribution of materials and balks were examined. Considering the fact that the objects used in our

simulation experiment as the material hampering the nesting process could be either natural material (i.e., plants, organic material, etc.) or artificial structures (i.e., umbrellas, sun beds, etc.) the conservation value of the proposed method is highlighted. General conclusions were also drawn about the importance of spatial simulation models in sea turtle conservation and management of the nesting sites.

PRELIMINARY DATA ON STRANDED AND ON LANDED ACCIDENTALLY CAUGHT, LOGGERHEAD TURTLES IN MALTA (P)

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In the waters around the Maltese Islands the Loggerhead Turtle is relatively common and is accidentally caught in significant numbers too. Some of these accidentally caught turtles are nowadays landed and transferred to the recently available holding and rehabilitation facility at the Malta Centre for Fisheries Sciences at Torri San Lucjan, M'Xlokk, of the Fisheries Conservation and Control Division. Most of these turtles are eventually released after treatment and rehabilitation. The database compiled from this incoming data, gives us indications of mortality rates, numbers released and growth rates as well as other indications, which help in directing conservation efforts. Malta started tagging turtles in 1991 and since then thirty-two turtles were tagged and twenty-eight turtles were released between 2002 and 2004 in two mass releases. Although there is an occasional incidence of post-operative death, and a few turtles which due to severe physical handicaps which limit swimming abilities, have remained at the Centre, the incidence of reinstating back to health is quite successful. This paper, thence, aims to give data regarding the status of the loggerhead turtles in the Maltese Islands. It is also the first local paper providing data on the success rates of the first attempts of rehabilitation, resulting after public awareness to fishermen, which increased the incidence of landings of such injured specimens.

ANALYSIS OF TAGGING AND RECOVERING OF MARINE TURTLES IN MALTA (P)

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The aim of this paper is to present data regarding the recapture of turtles tagged in Malta and elsewhere and to make possible postulations regarding movements and migration routes and possible inferences on ecology and growth. The major local threat for turtles is accidental capture in long line fisheries with landed captures being rehabilitated at the Malta Centre for Fisheries Sciences at Torri San Lucjan, M'Xlokk. Released specimens, after treatment and rehabilitation, are sometimes again recaptured in Malta or in other countries in the Mediterranean. Such recapture data can give insight even about the behaviour and ecology of these reptiles. There are at least four encounters of such recaptured specimens either tagged in Malta or elsewhere or recaptured or vice versa. One specimen tagged in Malta was found

in the western Mediterranean confirming migration routes from the central parts of the Mediterranean to the western regions, turtles tagged in eastern parts migrating to central regions were also found. One of the turtles tagged and released in Malta was recaptured again in the Maltese Islands after a number of years, confirming movements to previously visited places even though nesting is no longer carried out in the Maltese Islands. A further case of a recaptured turtle tagged in Italy also postulates some movements towards the south central regions. Recapture data demonstrate the efficiency of releases and gives rise to postulations on planning of further releases with better technologies.

MARINE TURTLES IN MALTA: LEGAL FRAMEWORK, CONSERVATION EFFORTS AND A STATUS UPDATE (O)

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Five species of marine turtles are recorded in the Maltese Islands. The Loggerhead Turtle is the most common; with the Green Turtle and the Leatherback turtle being relatively rare. Furthermore two other species were also recorded, namely, the Hawskbill and the Kemp‘s Ridley. The latter species was only recorded once; this record being the only one for the whole of the Mediterranean. The negative impacts of man‘s activities were more pronounced in the past, mainly because of lack of public awareness, with accidental and sometimes even intentional capture through fisheries, being the chief threat in Maltese waters. However, through the relatively recent adherence to a number of regional and international conventions, the publication of local regulations, and also through communication, and public awareness campaigns, aided by the involvement of local NGOs, marine turtles are facing a much better future in Maltese waters. Tagging of these turtles as well as data gathered from stranding or accidental capture is also accruing our knowledge on these reptiles even through a regional perspective by supplying information on migration routes. The additional rehabilitation measures available today, the drawing up of a code of practice, the establishment of a data base, the writing of a National Plan of Action [NPoA] in cooperation with the Fisheries Conservation and Control Division and the Nature Protection Unit of the Malta Environment and Planning Authority and the additional planned educational material will contribute to the desired protection strategy targeted towards more effective conservation of these marine reptiles.

PRELIMINARY DATA ON THE EPIBIONTS OF CARETTA CARETTA FROM MALTESE WATERS (P)

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The recent availability of holding and rehabilitation facilities for stranded turtles or those caught accidentally by fishers in Malta has permitted a detailed study of individuals being rehabilitated, including data on epibionts. Here we report preliminary results on the epibionts collected and identified from a few individuals of Caretta caretta. The species occurring were cirripeds including Chelonibia testudinaria and the hirudinian Ozobranchus margoi, the latter being a new record for Malta. Observations on the density, distribution and occurrence preferences of these epibionts, on the turtles‘ surface, as well as notes on their relation to the host‘s ecology, are given. Previous records of epibionts on Caretta carettafrom Maltese waters are also reviewed.

ASPECTS OF INTRA-COMMUNITY DIVERSITY IN SEA TURTLE CONSERVATION (O)

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Community participation in conservation initiatives for sea turtles has been recognized as central to the efficiency, legitimacy and sustainability of conservation efforts as it builds on indigenous knowledge of local communities and the hold that their presence in coastal areas gives them. This paper argues and supports previous research, indicating that only through recognition of diversity within local communities can the objectives of participatory initiatives be met. This will be demonstrated through fieldwork with the local community in Alexandria, Egypt, to demonstrate the diversity of their interests, stakes and motivations to engage in sea turtle conservation. Participatory tools will be developed and amended in accordance with the social, economic and cultural factors specific to the Alexandria context. In so doing, this paper will contribute to the ongoing debate on community participation in general, and its relevance and importance with regards to the conservation of endangered species in particular.

A NEW FORAGING AREA FOR *CARETTA CARETTA* IN THE MEDITERRANEAN SEA: THE CRAB POLYBIUS HENSLOWII (*DECAPODA: BRACHYURA*) AS A MAIN FOOD RESOURCE FROM NORTH WEST AFRICA (O)

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We present data on the almost exclusive diet of the Loggerhead turtle Caretta carettabased on five years of intensive research on dead and alive specimens from the South Bay of Ceuta (Spain), located across the Strait of Gibraltar, just within the first part of the Mediterranean Africa. At this foraging area, turtles of all stages and different origins, feed on the crab Polybius henslowii, which is not only particularly important in the Loggerhead‘s diet, but in other predator‘s diet, becoming essential for the whole marine ecosystem. Besides, recent data about the feeding ecology of the Loggerhead in the rest of the Moroccan coast is also presented, showing that the crab is also a very important food resource in these developmental areas. In addition, we analyse some aspects about what kind of feeder the Loggerhead turtle is (specific, generalistic or opportunistic). Investigations on the biology, ecology, pathology, osteology and conservation are presented as well.

MARINE TURTLE NESTING SITE EVALUATION SURVEY, TURKEY 2003 (P)

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In 1988, 2,456 km of Turkish coastline between Kusadasi in the Aegean region and Samandag close to the Syrian border was surveyed for marine turtle activity and 17 nesting beaches have been identified. 17 beaches along the Turkish Mediterranean coast which have been designated as Marine Turtle Nesting Beaches by the Ministry of Environment host regionally important species of Caretta caretta and Chelonia mydasturtles. In 1994, an assessment survey was carried out with the support of the WWF on the 17 major nesting beaches. As a result of this assessment, it was found that marine turtles and their habitats in Turkey were not adequately protected given Turkey's commitments under the Bern and Barcelona Conventions. The assessment report emphasized increasing anthropogenic threats at a majority of these sites. Since the comprehensive surveys of 1988 and 1994, although universities have monitored some particular nesting beaches regularly, a complete status assessment has not been undertaken. To provide this update, WWF Turkey carried out a comprehensive evaluation of marine turtle nesting sites in Turkey during the summer of 2003. The situation report produced was sent to all relevant authorities to be used as a site-safeguarding guide for better management of marine turtle nesting sites. The report concludes that 64% of the 17 most important nesting sites are not adequately protected.

RELATIONSHIP BETWEEN GREEN TURTLE NESTS AND PHYSICAL CHARACTERISTICS OF NESTING SAND IN THE SAMANDAG (ANTAKYA) COAST, TURKEY (O)

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This article presents the effects of physical characteristics of the nesting sand of Samandag Coast on green turtle‘s nest distribution and nesting density, in 2003 season. The first author worked as coastal geomorphologist, and second author worked as biologist in the project entitled "investigation of some physical and chemical parameters effects on green turtles‘ nest distribution, nesting density and sex differentiation in Samandag Coast". Topographical maps and aerial photos of Samandag coast from different dates were interpreted, afterwards field-check was conducted to investigate dynamics of the coast, and as well as to depict type of improper human activities. Samandag nesting zone has largely been subject to coastal degradation by means of intensive sand excavations. Intensity of man-made depressions along the coast enforced biologists to augment hatching success by relocating nests. In addition, the beach inclination has been reversed in many places, thus, renouncing turtles to nest. Prevailing winds from WSW creates distinct littoral drift to the NNW direction resulted with longer nesting zone on northern part of Asi Delta. Intensive nesting zone is located at both sides of river mouth at the mean 6-8% slope inclination, about 25 m distance from the coast. Grain size distribution of the most preferred nesting zone at nearby Asi mouth is heterogeneous; between 0 and 850 micrometer which reflects less sorted alluvium. In this zone, due to abundance of 600-850 micrometer coarse sand, as much as effect of fresh water, humidity and salt content of the sand are low, thus attracts nesting.

NETWORKING AMONG RESCUE CENTRES IN THE MEDITERRANEAN (O)

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The creation of a Mediterranean Network among Rescue Centres can play a key role in sea turtle conservation. At the moment, communication among the Rescue Centres operating in the region is limited, despite the fact that the causes of injuries are similar, mainly the result of turtles‘ incidental capture in fishing gear. The Network of Rescue Centres would be an ideal forum for exchanging expertise, discussing specific cases and sharing documentation and databases. This would help ensure a high quality of rehabilitation throughout the region, while it can play a supportive role for rescue centers that will be established in the future. Furthermore the Network can influence policy makers, suggest and implement conservation policies within the Mediterranean. The first steps for the establishment of a Network among Rescue Centres were taken during the Mediterranean Workshop for the rehabilitation of injured sea turtles, organized by ARCHELON the Sea Turtle Protection Society of Greece on 19-20 November 2004. The workshop was organized under a LIFE-Nature project, co-funded by the European Union, aiming to reduce the mortality of sea turtles at sea. This presentation aims to analyze the benefits of creating the Network of Mediterranean Rescue Centres, present the steps already taken and the progress made so far.

FIRST RECORD OF CONJOINED TWIN EMBRYO IN ITALY (P)

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We report the first finding of a conjoined twin embryo of Caretta caretta in Italy. The twin embryo was found in 2002, in the course the EU-Project "Caretta caretta", during a post-hoc examination of the unhatched eggs of a nest at the Pozzolana di Ponente beach in Linosa Island (Pelagie Islands, South Italy, 35°51‘N-12°51‘E). Twinning has been occasionally described in many turtle species. Twinning is thought to be much rarer in sea turtles than in freshwater species, though differences in twinning rate between sea- and freshwater turtles might be overestimated and be due to differences in the data collecting methods. In fact, in sea turtles, post hoc examination of unhatched eggs allows to find only those twins dead before hatching. Aberrant embryos as conjoined twin pairs usually die before piping, most of them in the early stages of development. During the last decade of nest monitoring at the Pelagie Islands, the two most important and long-term monitoring loggerhead nesting beaches in Italy, no twin embryos have been found and no findings have been reported in literature. In this work, we give a complete morphometric description of the twin embryo, which reached an advanced developmental stage. We show photos and an x-ray photograph that shows the vertebral column and the overall skeletal organization.

AT-SEA EVALUATION OF ARTIFICIAL BAIT IMPACT ON LONGLINE TARGET AND BY-CATCH SPECIES (P)

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In order to reduce loggerhead sea turtle bycatches without impacting negatively on swordfish (Xiphias gladius) catch size, we investigated the possibility (1) to reduce bait attractiveness, (2) to decrease the overall attractiveness of the fishing device, and (3) to utilize acoustic deterrents. Experiments were initially run at Cattolica "Delphynursery" in a round tank having a 10 m diameter during the EU-Life Project Caretta caretta. Later on, artificial baits were tested in the Sicilian Sea thanks to the co-operation of local fishermen. The natural bait (Scomber spp.) smell proved to be an important component for the detection of bait by turtles. Our findings showed that smell-less artificial baits are generally unattractive for turtles. The impact of artificial baits on target and by-catch species was evaluated during at-sea tests with swordfish fisheries in the context of the EU-Life Project Del.Ta.

PREFERENTIAL POSITION OF CIRRIPEDS EPIBIONT ON SPECIMENS OF *CARETTA CARETTA* CAPTURED IN LINOSA AND LAMPEDUSA WATERS (PELAGIE ISLANDS,SICILY,ITALY) (P)

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Presence and distribution of cirripeds, present on Caretta caretta bycatch, in the water surrounding the Pelagie Islands have been analysed to verify if they occupy a preferential position on the turtle and, should that be the case, if this position is species-specific. Loggerheads were taken in the First Aid Centre of Lampedusa and in the Marine Turtle Rescue Centre of Linosa in 2003-2004 during the EU-Projects "Caretta caretta" and "Del.Ta.". Cirripeds present on each turtle were mapped, sampled, identified, and counted. Turtles were measured and, if adults, were sexed. We found six species of Cirripeds: Chelonibia testudinaria(present on 11% of the 81 turtles examined), Conchoderma virgatum (62%), Lepas anatifera(22%), Lepas hilli(26%), Platylepas hexastylos(10%), and Stomatolepas elegans(2%). It was not possible to establish a connection between the presence of these epibionts and the size of the turtles. Nevertheless, the obtained data enable to test if the epibiont cirripeds of different species are distributed randomly or not. Chelonibia testudinariais significantly more frequent on the carapace, Conchoderma virgatum on the forelimbs and hind limbs, Lepas hilli on the marginal and supracaudal scutes, Platylepas hexastylos on the plastron. Only Lepas anatifera shows a wide distribution, however directed towards the marginal scutes. It is possible to hypothesize that this species-specific position of these cirripeds on the turtle body is a strategy adopted not to come into conflict because of the available space.

INTERNATIONAL MIGRATION OF LOGGERHEAD TURTLES FROM GREECE TO TURKEY AND LIBYA TRACKED BY SATELLITE (P)

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Two sub-adult to adult sized turtles were equipped with Argos transmitters in the course of two LIFE-Nature projects "Conservation management of Amvrakikos wetlands" and "Reduction of mortality of Caretta caretta in the Greek seas". One transmitter was placed in Amvrakikos Bay (NW Greece), a known important foraging area of loggerhead turtles. The other transmitter was placed on a turtle that had been rehabilitated in ARCHELON‘s Sea Turtle Rescue Centre near Athens. The first turtle departed the bay and migrated to the coast of Syria from where it moved north and west along the coast of Turkey. It finally settled for over 6 months in a restricted area of Turkey. The second turtle, after spending some time in the Saronic Gulf, made a directed migration south to the coastal region of Libya. Very few records of Greek tagged turtle encounters have come from these areas and this highlights one of the benefits of using remote sensing to follow turtle movements. Further, this study confirms the international nature of turtle conservation and the need for improved regional cooperation.

LEATHERBACK STRANDINGS IN GREECE (P)

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ARCHELON runs a national Sea Turtle Stranding Network in association with the Coast Guard of Greece and other agencies. All turtles encountered stranded along the Greek coast are reported to ARCHELON. The most common sea turtle species stranded in Greece is the loggerhead turtle (Caretta caretta), with major nesting and foraging areas known. Green turtles (Chelonia mydas) which nest to the east of Greece are also regularly encountered. The leatherback turtle (Dermochelys coriacea) is rarer than both and has no known nesting areas in the Mediterranean. However, records of it stranding along the Greek shores occur sporadically. This poster will present graphically all leatherback strandings recorded in Greece, sourced from published literature and from the records of the national stranding network initiated in 1990 and currently under improvement within the context of a LIFE-Nature Project "Reduction of mortality of Caretta caretta in the Greek seas". These observations will be discussed in the Mediterranean context for distribution and survival of this species.

MARINE TURTLE NESTING SURVEY, SYRIA 2004: DISCOVERY OF A "MAJOR" GREEN TURTLE NESTING AREA (O)

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Green turtle nesting in the Mediterranean is confined to the eastern Basin with most nesting occurring in Turkey and Cyprus. Lower nesting levels have been recorded across the rest of the Levant coast from Israel to Egypt. The 183km coast of Syria was briefly surveyed in 1991 and limited nesting (attributed to loggerheads) was found on 2 beaches. In 2004 a two-month survey of the beach south of Lattakia, that was shown to have most turtle tracks, was undertaken to confirm nesting levels, species responsible and train local workers in conservation methods. The survey found that the Lattakia beach holds a "major" (at Mediterranean level) green turtle nesting population with over 100 nests recorded on 12.5km of beach and that the main threats in the area are predation of eggs and hatchlings by foxes, dogs and ghost crabs, disorientation of hatchlings by artificial lights, vehicular use of the beach and nest inundation from storm waves.

CLUTCH SIZE AND HATCHING SUCCESS OF GREEN TURTLE NESTS IN SYRIA DURING 2004 (P)

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Nesting of the critically endangered Mediterranean green sea turtle (Chelonia mydas) was discovered in Syria in 2004. Part of the survey work involved relocating "doomed" nests that were laid too near to the sea and post-hatch excavation of a sample of nests. This poster will present data on green turtle clutch size determined from 4 relocated and 29 post-hatch excavated nests (mean 111.8 eggs) and compare it to other values published for Mediterranean green turtles. Hatching success determined from the nest excavations will also be presented and discussed. Hatching rates were found to be good in 2004 (83.5% hatched eggs) but overall hatchling production was much reduced from what was possible due to widespread nest depredation.

INCUBATION CONDITIONS OF THE LOGGERHEAD SEA TURTLE *CARETTA CARETTA* IN KYPARISSIA BAY, GREECE (O)

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Developing sea turtle embryos and emerging hatchlings may be vulnerable to environmental conditions within the egg chamber if these are outside their optimal range. These conditions, which include incubation temperature, moisture availability and gas exchange, are intricately linked with the composition of the nesting beach substrate. This study was conducted during the nesting seasons of 2001 and 2002 in Kyparissia Bay, western Peloponnesus, Greece, which represents one of the most important nesting areas for the loggerhead sea turtle in the Mediterranean. We considered how maternal factors, such as the selection of a suitable nest site, nest depth, and clutch size, interacted with the physical features of the nesting beach. We conducted analyses which considered the effects of the incubation environment on hatching success and hatchling body size. During the later stages of incubation, egg clutches experienced temperature increases of up to 2.7oC. This occurred as a consequence of metabolic heat production, which was related to the number of developing embryos within the egg clutch ($r^2=0.49$). Carbon dioxide concentrations were also positively related to the number of developing embryos ($r^2=0.51$), and increased from 0.17% to a maximum of 1.8% during incubation. The levels of carbon dioxide concentration attained did not appear to influence hatching success or hatchling body size. The possibility that temperature affected hatching and emergence success will be discussed.

TARTANET; A NETWORK FOR THE CONSERVATION OF SEA TURTLES IN ITALY (P)

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In recent years conservation activities regarding Caretta caretta, has taken on a strategic aspect throughout the Mediterranean. In Italy certain local programmes have been able to stem or thwart certain specific threats, especially in reference to safeguarding nesting sites, but the conservation effort has been fragmentary and uncoordinated. The primary objective of this project is to implement an effective, nationwide and long-term conservation strategy by creating a network of centres along Italy‘s coasts. Central coordination, the implementation of common procedures and a common data base will strengthen the effectiveness of individual conservation efforts and ensure that treated turtles will be fully reintegrated into their natural, biological dynamic as soon as possible. The Centres will also acquire important biological data in order to monitor the results of specific conservation measures in order to update the action plan.

The above objectives will be achieved through a series of actions calling for:

- the establishment of 5 new recovery centres in hot spots
- the creation of a sea turtle network among the new centres and those already existing
- coordination and standardization of pro-grammes and activities concerning Caretta caretta
- experimentation of systems to reduceaccidental catch
- creation of a web portal regarding sea turtles
- creation of a package of programmes aimedat informing and training fishermen
- preparation of a national plan for reducedinteraction with fishing activities
- creation of a programme of public-awarenessmeasures.

MYCOFLORA OF LOGGERHEAD TURTLE, CARETTA CARETTA, NEST AND EGGSHELL AT FETHIYE (TURKEY) (O)

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The aim of this study was to investigate the mycoflora of loggerhead turtle, Caretta caretta, nests and eggshell at Fethiye, Turkey. During 2004 breeding season, after emergences of the hatchlings had completed, sand samples were collected from 15 nests and eggs from these nests were swabbed. These samples were refrigerated at 4oC until analysis. Rose Bengal Chloraphenicol Agar was used for isolation, then mycoflora were subcultured onto suitable media. Fungi were counted and identified at genus level. As a result, 10 genera were detected Absidia sp., Aspergillus sp., Chrysosporium sp., Cladosporium sp., Cylindrocarpon sp., Emericella sp., Fusarium sp., Mucor sp., Penicillum sp. and Thielavia sp. in the nests and eggshells.

LOGGERHEAD IN RICCIONE: MEASUREMENTS FOR A SUBADULTS "HOLIDAY" AREA (P)

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Starting from 1986 Fondazione Cetacea in Riccione rescues and collects injured or dead sea turtles. Up to the end of 2004, information on 775 Caretta carettawere archived relatively to the western Adriatic coasts area, namely Emilia-Romagna region with some specimens from Marche and Veneto. The measurement data on 542 specimens are presented: CCL, width of carapace, plastron length and head length are used to describe composition of the local group and the distribution along the seasons. Specimens are mostly concentrated between June and September, with the 62% of the whole presence. Dead or alive specimens are recorded without any statistical differences depending on the periods of the year. Carapace lengths (N = 539) show a median of

47.78 cm (Standard deviation = 18.97) witha range between 6 and 110 cm. Also measurements of plastron (N = 542, median

47.67 cm with S.D. 19.10) and head (N = 181,median 11.09 cm with S.D. 4.01) are reported. The most recorded class of measurements in the area is represented by subadults (from 21 and 70 cm of CCLs) with the 79% of the whole sample, followed by 15% of adults and a 6% of young. Two post-hatchlings were collected in 2003.

A PARASITOLOGICAL SURVEY OF LOGGERHEAD TURTLES (CARETTA CARETTA) FROM THE NORTHERN ADRIATIC SEA (P)

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During 2004 a parasitological survey was carried out on 18 loggerhead turtles (Caretta caretta) from northern Adriatic coast. 14 subjects stranded dead and 4 were still alive and admitted to Fondazione Cetacea Rescue Center (3 died and one released). All the dead loggerhead turtles were necropsied and parasitological examination was performed. The parasites were collected, cleaned in saline solution, fixed in 70° ethanol and clarified in Amman‘s lactophenol. Some nematodes were SEM processed and observed under a Jeol 5200 scanning electron microscope. Five turtles (27.7%) out of 18 were positive for parasites. Five helminth species, four digenean trematodes and one nematode, were found in the digestive tract. In one intestine host were found Pleurogonius trigonocephalus (78), Orchidasma amphiorchis(14) and Rhytidodes gelatinosus (2). The last was also found in another turtle with 3 specimens. In one C. carettawe found Enodiotrema megachondrus (17 in intestine) and Sulcascaris sulcata (3). Sulcascaris sulcatawas found also in other 2 specimens in stomach and esophagus with 3 and 152 parasite/host). The parasitological findings here described are consistent with previous reports from loggerheads in the Mediterranean. Further studies appear necessary to outline the life cycle of the potentially pathogenic nematode S. sulcata in the Mediterranean Sea.

THE SEA TURTLE STRANDINGS NETWORK IN THE VALENCIAN REGION (SPANISH MEDITERRANEAN) (O)

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A preliminary report on the stranding records of the Valencian Region (Spain) network was presented in the First Mediterranean Conference on Marine Turtles in 2001. That report showed a spectacular increase in the number of loggerhead strandings in 2001, probably due to an unusual large migration of turtles into the Western Mediterranean. Three years latter, we confirm that the number of strandings has turned to the normal values, with a slight increase, probably caused by the improvement of the functioning of the network since differences, either in the fishing effort and in other threats, are not detected. Since

1995, a total of 488 turtles have been accounted along the 419 km of coast (from 40º31‘N -0º31‘E to 37º51‘N - 0º45‘W), with a mean of

48.8 ± 31.6 turtles (40.2 ± 17.2, excluding2001) per year and a maximum of 61 turtles registered in 2004. Strandings occur frequently in summer time, during July and August. The importance of detected anthropogenic threats to sea turtles is discussed within the framework of the Valencia Region which is an area of highly developed tourism and fisheries activities. The stranding network includes a tagging programme of live stranded turtles, recovered and released to the sea. Tagging and recapture data are also presented, showing a complex variety of movements of subadult loggerheads within the western basin of the Mediterranean Sea.

ADVANCES IN *CARETTA CARETTA* FEEDING ECOLOGY: STRANDINGS VERSUS INCIDENTAL CAPTURES (P)

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We analysed the gut contents of 46 loggerhead turtles (Caretta caretta) stranded on beaches of the Valencian coast (east Spain) between 1995 and 2004. The results are compared with a previous study of 54 loggerhead turtles seized in Barcelona in 1991, predictably captured at sea by trawlers in the Spanish Mediterranean. Most of the stranded turtles die because of a bad health condition, preventing them from a normal feeding behaviour before the stranding, or due to anthropogenic causes related to feeding strategies, such as ingestions of long line hooks or debris. Therefore, we might expect stranded turtles to have, first, lower frequency of appearance and abundance of prey items and, second, more anthropogenic debris in their gut contents than those captured. Frequencies of appearance of food items were similar in both samples, and also we found a high variety of benthic and pelagic prey species in the stranded turtles. However, pelagic tunicates were more frequent and abundant in the stranded ones. The frequency of appearance of debris was similar in both samples. However, the number and volume of debris items was higher in the stranded turtles. The present study gives more evidence on the opportunistic feeding habits of this species. The importance of pelagic tunicates and the higher amounts of floating debris may be the result of feeding predominantly in the water column, since normal divings to capture benthic invertebrates can be limited by the bad health condition of the turtles.

REPRODUCTIVE ECOLOGY OF THE LOGGERHEAD TURTLE, *CARETTA CARETTA*, ON FETHIYE BEACH, TURKEY IN 2004 (P)

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In this study, the Yaniklar and Akgol subsection beaches of Fethiye beach were examined during 2004 breeding season. A total of 117 emergences were recorded with 33 (28.2%) resulting in nests. The nest density was 5.6 nests/km. A total of 2532 eggs were laid in 33 nests with mean clutch size of 76.7 (range:

54-107). Of these eggs, 1752 (69.2 %) hatchlings come out and 1615 (92.2 %) hatchlings were able to reach the sea.

ENVIRONMENTAL AWARENESS AND EDUCATION: KEYS TO CONSERVATION (O)

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The paper will examine the practicalities and ethos of 4 successful environmental education projects as a guide to success.

"Small Garbage, the Deadly Illusion." Thrown into the sea, "it disappears". This aims to inform and educate both children and adults about the effects of "small garbage" items on the marine environment and the creatures of the Mediterranean, emphasizing personal responsibility, and making individuals pro-active against pollution.

EuroTurtle, was Europe‘s first educational and scientific website for the conservation and biology of sea turtles. In 2003 over 134,000 visitors visited the site. It has collected a number of awards, having been recommended and selected by several international educational institutions as one of the top six environmental educational websites.

The Mediterranean Sea, A Source of Life. -An Environmental Education and Awareness Kit in Greek or English for Children aged 6

13. Soon to be available in Arabic. Connectingenvironmental and cultural issues, it deals with the fragile balance of the Mediterranean ecosystem, its biodiversity, threats, monuments and religions, making children aware and actively involved in environmental conservation.

The "Sea Turtle Handling Guidebook for Fishermen" by Guido Gerosa and Monica Aureggi has now been translated and produced in Greek for UNEP/MAP-RAC/SPA. Fisheries interaction is a major threat to the survival of endangered sea turtles in the Mediterranean. Thousands are caught each year. The waterproof guide provides simple and practical advice with illustrations for fishermen.

PRELIMINARY STUDY ON SAND AND GREEN TURTLE NEST TEMPERATURES AND SEX RATIO OF HATCHLINGS ON SAMANDAG BEACH, TURKEY (P)

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Samandag Beach, which is important for nesting activity of endangered green turtles, is located at the most eastern part of the Mediterranean in Turkey. The sand and nest temperature were investigated in Samandag Beach, which is about 14 km in length, during the 2003 nesting season. Sand temperatures were measured periodically by using electronic temperature recorders in different beach locations including Chelonia mydas nests at different depths. Various data such as distance from sea, river, vegetation, and road (if there was) were also recorded. In total, 6 Chelonia mydas nest temperatures were

recorded. It was observed that the sand temperature was high near the sea and a little decreased (0.4 - 0.8 oC) at the back. Mean incubation temperature was measured between 29.4 and 31.4 oC. Temperature data and histological examination of the gonads of dead hatchlings suggest a female dominated sex ratio on Samandag Beach.

THE EFFECTS OF SOME ELEMENTS (CA, MG AND CR) ON NESTING ACTIVITY OF GREEN TURTLES IN SAMANDAG BEACH, TURKEY (O)

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Samandag Beach is one of the most important nesting habitats of Chelonia mydas(L.,1758) which is an endangered species. Some elements (Ca, Mg and Cr) were analysed in sand samples which were collected from Samandag Beach. A total of 150 sand samples were collected mainly from three types of locations: near the nest chambers, the adult‘s track and non-track (one location every 2 km randomly); and also from three levels in each location: surface, 30 cm deep and 80 cm deep. The metal concentrations were digested by using hydrofluoric acid and analysed by using ICP-AES. Some biological data about nesting activity such as nest density and nesting success also were monitored in 2003 nesting season. The mean concentrations of the elements of [Ca], [Mg] and [Cr] in whole sand samples were measured as 278.0 ppm ± 121.97, 317.0 ppm ± 9.92 and 5.39 ppm ±

1.38 respectively. It was observed that [Ca], [Mg] had a significantly positive correlation with nesting success ($r = 0.717$ for [Ca] and $r = 0.672$ for [Mg]; $p<0.001$). Also [Cr] was observed as having a positive correlation ($r = 0.760$; $p<0.001$) with nest density.

COMPARISON OF THE HATCHLINGS OF NATURAL AND HATCHERY NESTS OF LOGGERHEAD TURTLES (*CARETTA CARETTA*) ON DALYAN BEACH, TURKEY (P)

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In this study, the hatchlings of 34 natural (734 hatchlings) and 49 hatchery (1188 hatchlings) nests were compared in terms of some measurements (SCL, SCW and weight) and carapacial scute deviations. The vertebral, costal and marginal series were the most variable and the supracaudal scutes were almost stable for the hatchlings. The most common scute pattern observed in natural nests was 12 (62.53%) pairs of marginals, 5 (92.10%) pairs of costals, 5 (91.96%) vertebrals, 2 (100 %) supracaudals and single nuchals

(95.23 %). The most common scute patternobserved in hatchery nests was 12 (57.07 %) pairs of marginals, 5 (93.94 %) pairs of costals, 5 (88.22 %) vertebrals, 2 (100 %) supracaudals and single nuchals (98.48 %). The mean SCL and SCW of the hatchlings in natural nests were 40.48±1.60 (range=33.54-

43.62) mm and 31.73±1.38(range=25.20-36.46)mm respectively. The mean weight was 14.81±1.76 (range=8.70-18.90) g in natural nests. The mean SCL and SCW in hatcheries were 40.39±1.34 (range= 35.60-44.48) mm and 31.48±1.10 (range=27.50-34.60) mm respetively. The mean weight was 14.51±1.41 (range= 9.60-18.40) g. The SCW of the hatchlings in hatcheries was smaller than that of natural nests (ANOVA F= 19.65, $p<0.001$). The weight of the hatchlings in hatcheries was also smaller than the natural ones (ANOVA F= 16.77, $p<0.001$). The scute deviation percentages were higher in hatcheries. This difference was supported statistically as well (Chi-square test, $p<0.05$).

POST-NESTING MOVEMENTS OF LOGGERHEAD SEA TURTLES FROM A MAJOR MEDITERRANEAN NESTING AREA ASSESSED BY SATELLITE TELEMETRY (P)

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The Bay of Laganas on the Greek island of Zakynthos hosts the by far largest known nesting aggregation of loggerhead sea turtles (Caretta caretta) in the Mediterranean. Monitoring and conservation efforts have been focussing on the land based stages, while knowledge on habitat use at sea is only fragmentary. Some foraging areas have been identified through tag-returns from flipper tagging. One of the major drawbacks of this method is however that it only renders information on two point of the migration. On the Mediterranean scale, information on migration routes for loggerhead sea turtles only exists from minor nesting areas or rehabilitated individuals. We started to fill this gap by satellite tracking three post-nesting turtles from Zakynthos in 2004. All three turtles nested again after transmitter attachment, which allowed for inferences about habitat utilisation during the inter-nesting interval. They were successfully tracked to their foraging habitats, where they occupied restricted, well-defined patches. Two individuals settled down in the Adriatic Sea, whereas the third moved to the Western Mediterranean to stop its migration in a previously unconfirmed foraging ground off Tunisia. Two individuals that were still transmitting at the time moved south during autumn: One individual left the Italian coast to move close to Corfu, while the other turtle moved into the Gulf of Gabes (Tunisia). This exemplifies that utilization and thus appropriate protection of at sea habitats is very complex. Even this very small sample size allowed to critically evaluate hypotheses on habitat utilisation put forward based on tag-returns.

LOGGERHEAD SEA TURTLE HATCHLING SEX RATIOS FROM ZAKYNTHOS: SMALL-SCALE DIFFERENCES MIGHT BE CRUCIAL FOR THE MEDITERRANEAN METAPOPULATION (O)

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Sex determination in sea turtles is temperature-dependent with cold temperatures producing males and warm temperatures females. This mechanism raises concerns in view of global warming. We estimated hatchling sex ratios in the nesting aggregation of loggerhead sea turtles (Caretta caretta) of the Greek island of Zakynthos (composed of six distinct nesting beaches) to investigate whether the individual beaches produce different sex ratios and to judge the importance of this largest Mediterranean nesting aggregation for the metapopulation. Estimates of hatchling sex ratios were obtained by clutch incubation duration and sand temperature profiles in 2003. In addition, we measured temperature within clutches to determine whether metabolic heating is likely to affect sex ratios. Clear-cut differences in estimated hatchling sex ratios were found between two groups of beaches. The overall hatchling sex ratio of Zakynthos was estimated at 75% females. Through a correlation of air with sand temperatures, we inferred to a rough estimate of hatchling sex ratios during the past 20 years. We conclude that high conservation priority should be given to the beaches producing a male-biased sex ratio. They seem to buffer the overall hatchling sex ratio of Zakynthos from the effect of climate warming. Since it is unlikely that any other major Mediterranean nesting aggregation produces a high number of male hatchlings, we hypothesize that the male loggerheads produced on Zakynthos are of great importance to the entire metapopulation.

IV. WORKSHOPS

WORKSHOP ON EDUCATION

Turtle Education for Tourists: identifying best practice

Coordinator: Ian BRIDE, MEDASSET, and Durrell Institute of Conservation and Ecology (DICE), University of Kent, Canterbury, CT2 7NS, U.K.

Efforts to conserve turtles will not succeed without adequate public understanding and support. Yet the negative pressures the tourist industry is exerting upon the turtle nesting beaches in the Mediterranean continue to increase despite the disproportionate growth of nature oriented tourist sector. With the need for effective ”turtle education‘ for tourists having never been greater, this workshop will seek to draw upon participants‘ knowledge and experience in order to identify the key parameters that comprise a basic ”curriculum‘, devise a common approach that can be shared and applied in practice, and discuss an appropriate strategy for its implementation.

WORKSHOP ON FISHERIES INTERACTIONS
Interaction of sea turtles with fisheries in the Mediterranean: possible and priority conservation measures

Coordinator: Paolo CASALE Species, TRAFFIC and Rescue Centres Programme, WWF Italy, via Po 25c, I-00198 Roma, Italy

More and more evidence is becoming available that fishing-induced mortality is a major threat for sea turtles in the Mediterranean. Each year turtles are probably killed in large numbers by fishing gears such as drifting long line, bottom trawl, and static nets. Although the problem is far from being completely understood, nevertheless available information is enough to urge immediate actions to reduce this threat. Several different approaches can be adopted, from reduction of fishing effort to mitigation measures, and some of them have been proposed and tested in other areas. This workshop aims at gathering together those interested in the problem of sea turtle by catch in the Mediterranean in order to: (a) enhance future cooperation on this fundamental conservation issue; (b) share knowledge, experience and opinions on what is the present situation and which are the hot-spots in the region; (c) discuss possible approaches suitable for the specific Mediterranean situation.

WORKSHOP ON TAGGING STANDARDIZATION

Coordinator: Andreas DEMETROPOULOS Cyprus Wildlife Society, P.O. Box 24281, 1703 Nicosia, Cyprus

In the Mediterranean region, there is need for standardization of different tagging techniques and at the same time there is a need to promote uniform data collection and reciprocal exchange of information within the region. A regional dissemination of information would improve the understanding of many different aspects of Mediterranean Sea turtle populations, highlighting conservation needs.

A working group has been set up by the Regional Activity Centre for Specially Protected Areas (RAC/SPA) and this group is meeting just prior to the Conference.

The Working Group meeting is expected to:

- Help in the collection of information on ongoing tagging programmes and methods used inthe Mediterranean.
- Be informed and discuss the past experience at RAC/SPA and its tagging programme
- Discuss the aims of tagging and the merits and drawbacks of the various tagging methods(plastic/metal flipper tags, PIT and other tags, location of tags, etc)
- Discuss the centralisation/exchange of information (Directory of Tagging Groups, inventories oftag used etc.)
- Come up with recommendations on the issue of centralisation of tagging data
- Come up with recommendations for the above, aimed inter alia at updating RAC/SPA‘s Tagging Manual and re-launching its Tagging Programme

The outcome and recommendations of the working group meeting are expected to be presented to the Tagging Standardisation Workshop for discussion and to the Contracting Parties to Barcelona Convention for adoption.

WORKSHOP ON REGIONAL RED LISTING

Coordinator: Jeffrey SEMINOFF Chair of Red List Task Force, IUCN/SSC Marine Turtle Specialist Group

One of the main functions of the Marine Turtle Specialist Group (MTSG) is to conduct Red List Assessments for marine turtle species based on a set of criteria that are defined by the IUCN. In this context, the MTSG undertakes global assessments of all marine turtle species. However, a regional approach has many advantages, mainly in respect of conservation priorities. Mediterranean Sea is a closed sea with its own nesting populations of Caretta carettaand Chelonia mydas. It is therefore an example area to implement a Regional Red Listing exercise. For this reason a 6-member Working Group has been formulated and will work before the Conference. The Working Group will present an initial report for discussion, within the Conference, during the scheduled Workshop on Red Listing.