



UNITED  
NATIONS

EP

UNEP/MED WG.553/Inf.9



**Mediterranean  
Action Plan**  
Barcelona  
Convention

20 January 2023  
English only

Third (Interim) Steering Committee Meeting of the EU-funded Marine Litter MED II Project

Istanbul, Türkiye, 8 February 2023

**Agenda Item 3: Progress on Marine Litter MED II Project Implementation**

**Midterm Progress report about the implementation of the national monitoring of CI 24 in Lebanon**

For environmental and cost-saving reasons, this document is printed in a limited number. Delegates are kindly requested to bring their copies to meetings and not to request additional copies.



# Midterm Progress report about the implementation of the national monitoring of CI 24 in Lebanon



**Legal notice:** 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 Specially Protected Areas Regional Activity Centre (SPA/RAC) and UN Environment/Mediterranean Action Plan (MAP) concerning the legal status of any State, Territory, city or area, or of its authorities, or concerning the delimitation of their frontiers or boundaries.

**Copyright:** All property rights of texts and content of different types of this publication belong to SPA/RAC. Reproduction of these texts and contents, in whole or in part, and in any form, is prohibited without prior written permission from SPA/RAC, except for educational and other non-commercial purposes, provided that the source is fully acknowledged.

© 2022 United Nations Environment Programme  
Mediterranean Action Plan  
Specially Protected Areas Regional Activity Centre (SPA/RAC)  
Boulevard du Leader Yasser Arafat  
B.P.337  
1080 Tunis Cedex – TUNISIA  
car-asp@spa-rac.org

**For bibliographic purposes, this document may be cited as:**

SPA/RAC-UNEP/MAP, 2022. Midterm Progress report about the implementation of the national monitoring of CI 24 in Lebanon. By Badreddine, A., Samaha, L., Abderrahim, M., Limam, A., & Ben-Nakhla, L. Ed. SPA/RAC. Marine Litter MED project. Tunis: 15 pages+ Annexes.

**Cover photo credit:**

© SPA/RAC, Ali BADREDDINE



The present report has been prepared in the framework of Marine Litter MED project financed by the European Union.

For more information:

[www-spa-rac.org](http://www-spa-rac.org)

**Midterm Progress report about the implementation of the national monitoring of CI 24 in Lebanon**

**Study required and financed by:**

Specially Protected Areas Regional Activity Centre (SPA/RAC)

Boulevard du Leader Yasser Arafat

B.P. 337 - 1080 Tunis Cedex - TUNISIA

**In charge of the study at SPA/RAC**

- Lobna Ben-Nakhla, Programme Officer - Species Conservation
- Marwan Abderrahim, Projects Assistant – Species protection

**In charge of the study at the Ministry of Environment of Lebanon**

- Lara Samaha, Head of the Department of Ecosystems

**Scientist responsible for the study**

- Ali Badreddine, PhD/researcher (Marine biologist/ benthic habitat/ fauna and flora and Marine Turtles specialist),  
Lebanon

## Table of Contents

|  |    |
|--|----|
| <b>1. Introduction</b> .....   | 1  |
| <b>2. National Sea turtles stranding networks and Monitoring CI24</b> .....                | 1  |
| <b>3. “Stranding networks” for sea turtles (January 2022-July 2022)</b> .....              | 6  |
| <b>4. Results related with marine litter ingested by the stranded marine turtles</b> ..... | 9  |
| <b>5. Conclusion and recommendations</b> .....   | 10 |
| <b>Annexes</b> .....   | 14 |

## 1. Introduction

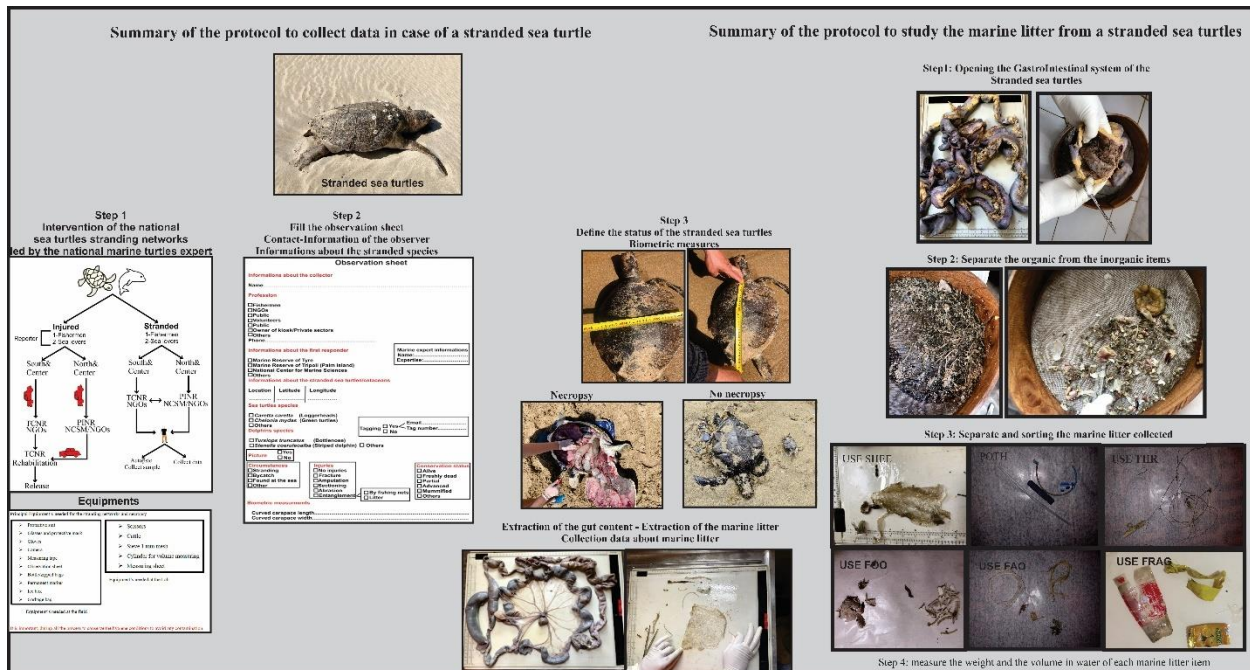
Under the 10th Ecological Objective (E010) of the Integrated Monitoring and Assessment Programme and related Assessment Criteria (IMAP), marine litter was considered as Common Indicators (i.e., CI221 and CI232) and a Candidate Indicator (CI24).

In this context, the “National Strategy For Monitoring IMAP Candidate Indicator 24”<sup>1</sup>, especially for sea turtles was elaborated on the first of September 2021 (SPA/RAC-UNEP/MAP, 2021a) in Lebanon. Recently, it has been well established along the Lebanese coast. In addition, CI24 has been implemented in the National Sea Turtle Stranding Networks (established in 2019) SPA/RAC-UNEP/MAP (2020a)<sup>2</sup>, and it is now considered an important monitoring tool within the Lebanese MPAs, Tyre Coast Nature Reserve (TCNR), and Palm Island Nature Reserve (PINR).

In this context, this report represents the ongoing progress and results of implementing the National Strategy for monitoring IMAP Candidate Indicator 24.

## 2. National Sea turtles stranding networks and Monitoring CI24

From a monitoring point of view, the methods and protocols proposed in the “National Sea Turtle Stranding Networks” and the “National Strategy For Monitoring IMAP Candidate Indicator 24” have been applied (Fig. 1).

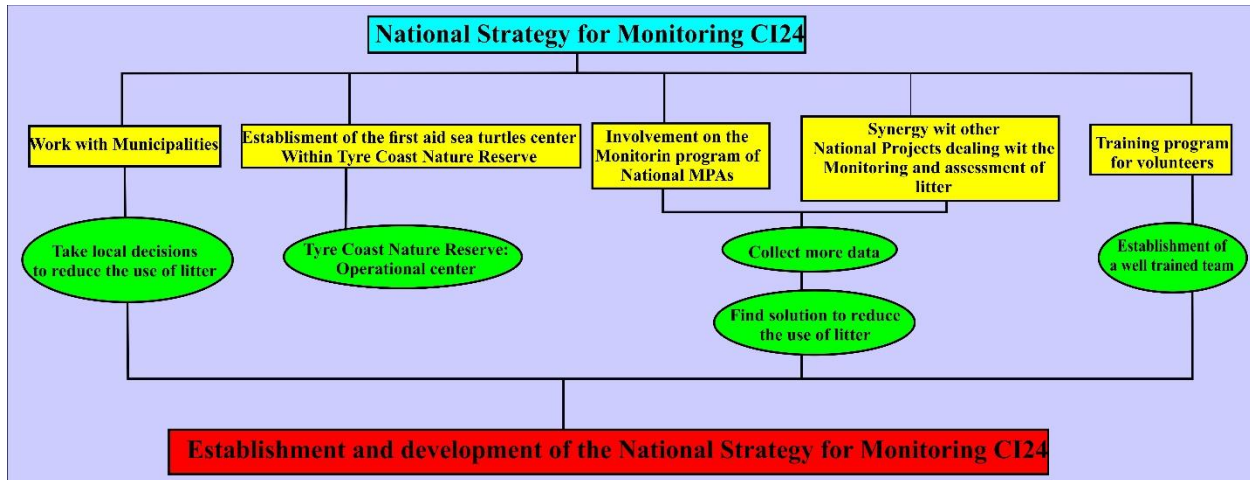


**Figure 1. Methods and protocol for monitoring CI24: Summary of steps to be followed in case of stranded sea turtles and protocols to study the impact of marine litter on sea turtles**

<sup>1</sup> SPA/RAC-UNEP/MAP, 2021a. Lebanon National strategy for monitoring IMAP Candidate Indicator 24. By Badreddine, A., Samaha, L., Abderrahim, M., Limam, A., & Ben-Nakhl, L. Ed. SPA/RAC. Marine Litter MED project. Tunis: pages 25.

<sup>2</sup> SPA/RAC-UNEP/MAP (2020a). A Stranding Network for Sea Turtles and Cetaceans & A Protocol for Monitoring the Interaction between Marine Litter and Marine Turtles in Lebanon. By Badreddine, A., Samaha, L., Joumaa, F., Abderrahim, M., Limam, A., & Ben-Nakhl, L. Ed. SPA/RAC. Marine Litter MED project Tunis: pages 19 + Annexes.





**Figure 2.** The activities done within the period January 2022 and August 2022

It has been focused on the well establishment and development of many points suggested in the National Strategy For Monitoring CI24 (Fig. 2):

- Increase the involvement of MPAs (Tyre Coast Nature Reserve-TCNR, and Palm Island Nature Reserve-PINR) in the monitoring program (with a special focus on monitoring CI24) and with the collaboration of the Ministry of Environment and Municipalities of Tyre and Tripoli (Al-Minah).
- Establishment of the first aid sea turtle rescue center within Tyre Coast Nature Reserve (considered as the operational center of all sea turtles activities along the Lebanese coast).
- Increase the involvement of national stakeholders (especially Gouvernemenal Organizations (GO), Non-Gouvernemenal Organizations (NGOs), Research Institues, Universities, divers, fishers, Civil Defense, students, volunteers) in the monitoring of CI24 (Fig. 3).



**Figure 3.** Participation of National Stakeholders (Ministries, Municipalities, Local Communities, Volunteers) to the realese of an injured sea turtles after rehabilitation in the first aid sea turtle rescue center in Tyre Coast Nature Reserve

- Organize many training activities to local communities (especially volunteers involved in the monitoring program of MPAs).

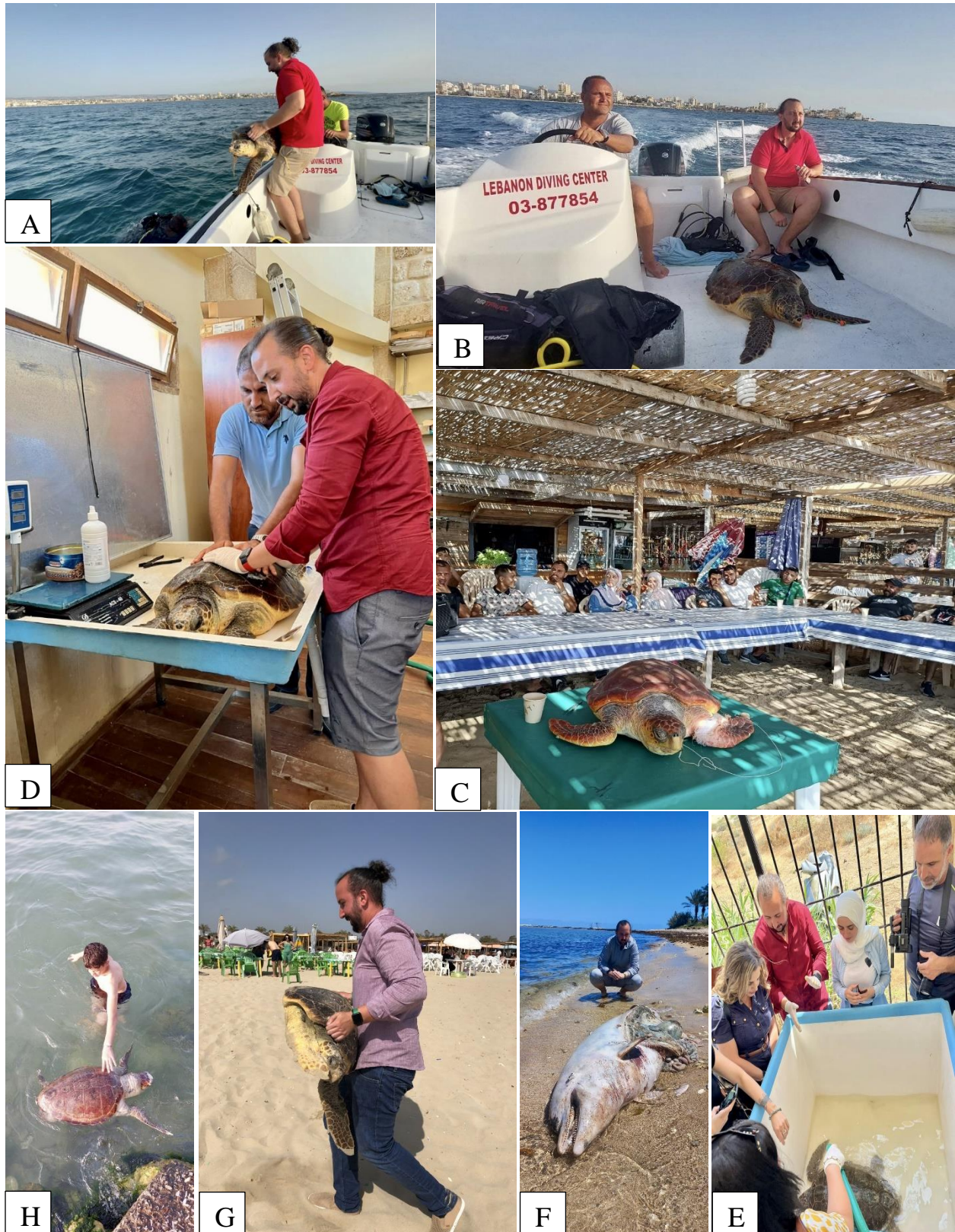


- Collection and analyzes of data (in coordination with the sea turtles national stranding networks).
- Synergy with other national projects dealing with marine litter monitoring and assessment (especially within the MPAs).
- Working more with Municipalities and Ministry of Environment (MoE) and Agriculture (MoA) (especially to establish some policies and decisions allowing to reduce the use of litter, especially within the MPAs).
- Enforce the execution of laws, especially related to illegal fishing methods, especially within the MPAs.
- Take the opportunity of the organization of some events (e.g., the release of sea turtles hatchlings) to share with the participants Infos on “National Strategy For Monitoring IMAP Candidate Indicator 24”.
- Preparation of brochures and posters sensibilize the public to avoid the use of plastic and allowing the implementation of the “National Strategy For Monitoring IMAP Candidate Indicator 24” (Fig. 4).
- Implementation of the activities proposed in the “Report on the organization of capacity building activities for national teams being involved in monitoring of IMAP Candidate Indicator”<sup>3</sup> (SPA/RAC-UNEP/MAP, 2022a).
- Integration of the national press to share the project and its outputs made it to National Level.
- Involvement of local communities to realise accessories (handmade) by te use of plastics for a sensibilisation purposes (Fig. 6).
- Made a Sea Turtles Maquette for Sensibilization purpose (Fig. 4)



Figure 4. A sea turtles Maquette and Brochures for sensibilization

<sup>3</sup> SPA/RAC-UNEP/MAP, 2022a. Report on the organization of capacity building activities for national teams being involved in monitoring of IMAP Candidate Indicator. By Badreddine, A., Samaha, L., Abderrahim, M., Limam, A., & Ben-Nakhla, L. Ed. SPA/RAC. Marine Litter MED project. Tunis: pages 12.



**Figure 5.** Activities done under the National Strategy for monitoring CI24. A and B: Release a sea turtle with the participation of local diving center in Tyre. C. Training to local communities on monitoring CI24 in Tyre. D and E rescued sea turtles in the first



aid rescue center in Tyre Coast Nature Reserve with the participation of the Ministry of Environment and Local Stakeholder and National press. F. The involvement of the sea turtle stranding network also follows any stranded cetacean and collection of data. F and G and H. Rescuing sea turtles with the participation of local communities.



**Figure 6.** Accessories made of plastics as an awareness to reduce the use of plastics

### 3. “Stranding networks” for sea turtles (January 2022-July 2022)

A total of 175 sea turtle stranding incidents were reported from January 2022 until July 2022 across the Lebanese coast (Fig. 8).

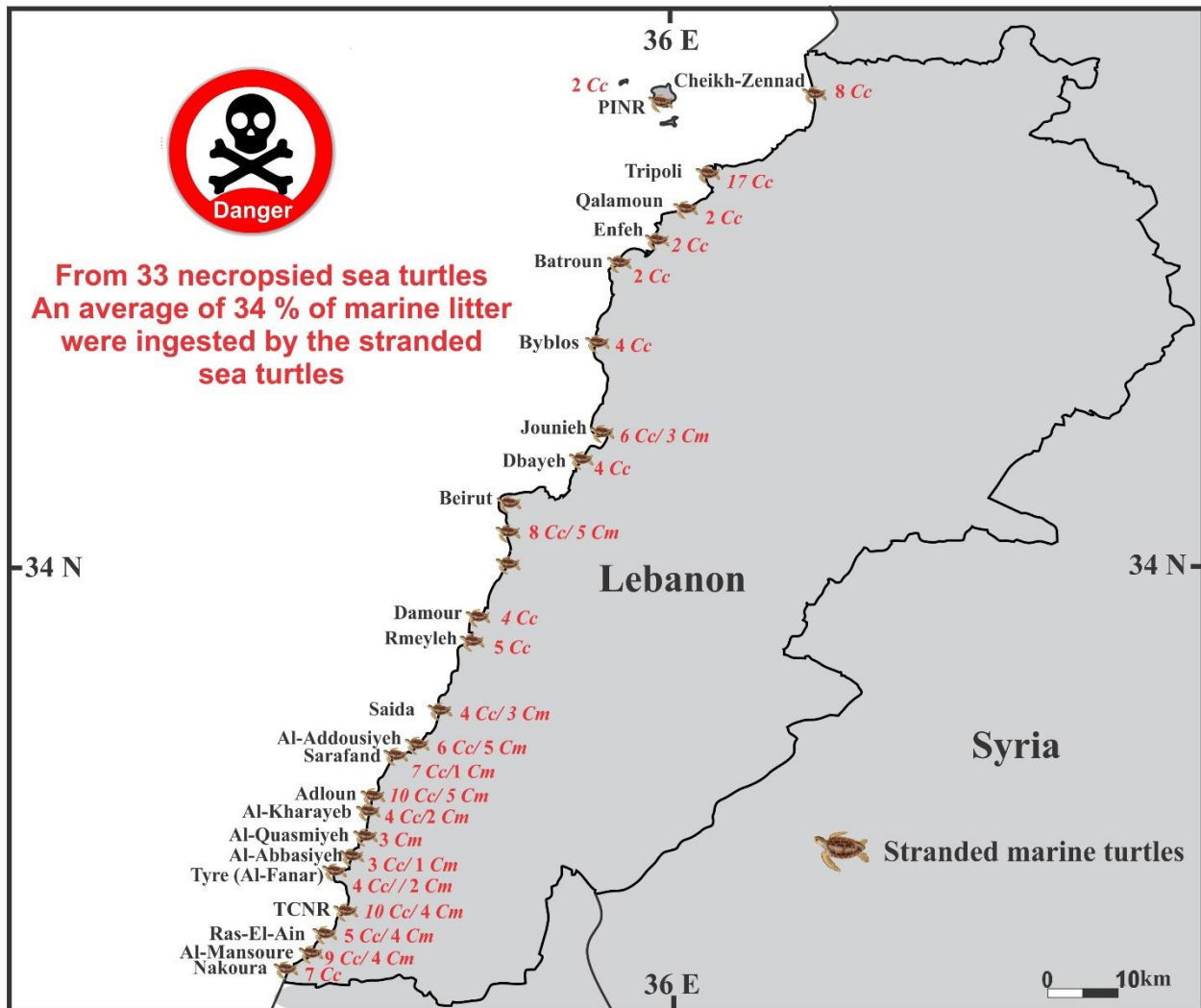
The loggerheads *Caretta caretta* were the most reported and accounted for 133 incidents: the majority are female adults (Tab. 1). While 42 stranded green turtles *Chelonia mydas* were reported, most are females and all juveniles (Tab. 1). Among them, 15 incidents of stranded sea turtles were in advanced stages of body decomposition. It was, therefore, difficult to define the sex, life stage, and morphological measurements.

The main cause of the death of stranded sea turtles in 2022 (Table 2), is more related to illegal fishing activities (41.14 %), boat traffic (27.42%) (Table 2), followed by marine pollution (22.85 %) (Figure 5). However, the cause of the death of 15 stranding sea turtles (with 8.57%) was difficult to determine because of the advanced stages of body decomposition/ or observed floating on the sea waters. And the main cause of death of the stranded marine turtles related to fishing activities is mainly due to the use of illegal fishing methods (especially dynamites), intention kills, and fishing nets (as the stranded marine turtles are accidentally trapped/ or entangled in the fishing nets) (Fig. 7 and Fig. 10).

It is worth noting that these results (175 sea turtle stranding incidents) are due to the good establishment of the Sea turtles Stranding networks and the efficacy involvement of all stakeholders in this program. The sea turtles stranding network established in Lebanon follows also cetacean stranding networks (Fig. 5).



**Figure 7.** Stranded sea turtles along the Lebanese coast. A. Stranded *Caretta caretta* entangled by fishing nets; B. Stranded *Caretta caretta* found in the port of Tyre; C. Stranded *Chelonia mydas* found in the vermetid reefs of Abbasiyeh



**Figure 8.** Map shows the stranded marine turtles along the Lebanese coast from January 2022-July 2022.

**Table 1**

Number of stranded sea turtles (n), sex\* of the stranded species, Curved Carapace Length - CCL (min ± max; Mean ± Standard deviation (SD) in cm) and Life stage\*

| Species                     | n   | Sex*                  | CCL min ± CCL max | CCL (Mean ± SD) | Life stage*              |
|-----------------------------|-----|-----------------------|-------------------|-----------------|--------------------------|
| <i>Caretta caretta</i> (Cc) | 120 | 75 females / 45 males | 25 ± 98           | 68.7 ± 2.7      | 120 adults/ 13 juveniles |
| <i>Chelonia mydas</i> (Cm)  | 40  | 26 females / 4 males  | 23 ± 92           | 58 ± 0.9        | 30 adults / 12 juveniles |
| Cc (Unknow details)         | 15  | x                     | X                 | X               | x                        |

\*Based on the CCL measurements, the sea turtles individuals were classified according to their life cycle stage: sea turtles with a CCL (< 65 cm) were considered juveniles, and those larger were considered adults, according to the Mediterranean population (Pers.comm. Yakup Kaska).

**Table 2**

Causes of death of the stranded marine turtles reported from January 2021 until December 2021 per Area. *Cc*: *Caretta caretta* and *Cm*: *Chelonia mydas*

\* The causes of death of sea turtles were categorized as follows: fishing activities (e.g. fishing nets, net fragment, ropes, hook in jaws, mouth, esophagus, stomach or intestinal, gillnet fishing gear in cloaca or mouth); marine pollution (ingestion of plastic in the digestive system); hit by a marine vehicle (fishing boat and speedboat) and the last category as an unknown cause.

| Areas/ Causes of death | Fishing activities          | Marine pollution            | Boat traffic                | Unknown                       | Total                        |
|------------------------|-----------------------------|-----------------------------|-----------------------------|-------------------------------|------------------------------|
| <b>South-Lebanon</b>   |                             |                             |                             |                               |                              |
| Nakoura                | 4 <i>Cc</i>                 | 2 <i>Cc</i>                 | 1 <i>Cc</i>                 |                               | 7 <i>Cc</i>                  |
| Al-Mansoure            | 4 <i>Cc</i> / 1 <i>Cm</i>   | 2 <i>Cc</i> / 1 <i>Cm</i>   | 1 <i>Cc</i> / 1 <i>Cm</i>   | 2 <i>Cc</i> ?*/ 1 <i>Cm</i> ? | 9 <i>Cc</i> / 4 <i>Cm</i>    |
| Ras-El-Ain             | 1 <i>Cc</i> / 4 <i>Cm</i>   | 1 <i>Cc</i>                 | 2 <i>Cc</i>                 | 1 <i>Cc</i> ?                 | 5 <i>Cc</i> / 4 <i>Cm</i>    |
| TCNR                   | 5 <i>Cc</i> / 2 <i>Cm</i>   | 4 <i>Cc</i> / 2 <i>Cm</i>   | 1 <i>Cc</i>                 |                               | 10 <i>Cc</i> / 4 <i>Cm</i>   |
| Al Fanar               | 2 <i>Cc</i>                 | 2 <i>Cm</i>                 | 2 <i>Cc</i>                 |                               | 4 <i>Cc</i> / 2 <i>Cm</i>    |
| Al-Abbasiyeh           | 1 <i>Cc</i>                 | 1 <i>Cc</i> / 1 <i>Cm</i>   | 1 <i>Cc</i>                 |                               | 3 <i>Cc</i> / 1 <i>Cm</i>    |
| Al-Quasmiyeh           | 2 <i>Cm</i>                 | 1 <i>Cm</i>                 |                             |                               | 3 <i>Cm</i>                  |
| Al-Kharayeb            | 1 <i>Cc</i> / 1 <i>Cm</i>   | 1 <i>Cc</i> / 1 <i>Cm</i>   | 1 <i>Cc</i>                 | 1 <i>Cc</i> ?                 | 4 <i>Cc</i> / 2 <i>Cm</i>    |
| Adloun                 | 5 <i>Cc</i>                 | 5 <i>Cc</i>                 | 5 <i>Cm</i>                 |                               | 10 <i>Cc</i> / 5 <i>Cm</i>   |
| Sarafand               | 2 <i>Cc</i>                 | 2 <i>Cc</i>                 | 3 <i>Cc</i>                 | 1 <i>Cm</i> ?                 | 7 <i>Cc</i> / 1 <i>Cm</i>    |
| Al-Addousiyeh          | 1 <i>Cc</i>                 |                             | 3 <i>Cc</i>                 | 2 <i>Cc</i> ? / 5 <i>Cm</i> ? | 6 <i>Cc</i> / 5 <i>Cm</i>    |
| <b>Mount-Lebanon</b>   |                             |                             |                             |                               |                              |
| Saida                  | 1 <i>Cc</i>                 | 1 <i>Cc</i>                 | 2 <i>Cc</i> / 3 <i>Cm</i>   |                               | 4 <i>Cc</i> / 3 <i>Cm</i>    |
| Rmeyleh                | 5 <i>Cc</i>                 |                             |                             |                               | 5 <i>Cc</i>                  |
| Damour                 |                             | 2 <i>Cc</i>                 | 2 <i>Cc</i>                 |                               | 4 <i>Cc</i>                  |
| Beirut                 | 2 <i>Cc</i>                 | 6 <i>Cc</i> / 4 <i>Cm</i>   | 1 <i>Cm</i>                 |                               | 8 <i>Cc</i> / 5 <i>Cm</i>    |
| <b>North-Lebanon</b>   |                             |                             |                             |                               |                              |
| Dbayeh                 | 2 <i>Cc</i>                 | 1 <i>Cc</i>                 | 1 <i>Cc</i>                 |                               | 4 <i>Cc</i>                  |
| Jounieh                | 3 <i>Cc</i>                 | 3 <i>Cc</i>                 | 3 <i>Cm</i>                 |                               | 6 <i>Cc</i> / 3 <i>Cm</i>    |
| Byblos                 | 2 <i>Cc</i>                 | 1 <i>Cc</i>                 | 1 <i>Cc</i>                 |                               | 4 <i>Cc</i>                  |
| Batroun                | 1 <i>Cc</i>                 |                             | 1 <i>Cc</i>                 |                               | 2 <i>Cc</i>                  |
| Enfeh                  |                             |                             | 2 <i>Cc</i>                 |                               | 2 <i>Cc</i>                  |
| Qalamoun               | 2 <i>Cc</i>                 |                             |                             |                               | 2 <i>Cc</i>                  |
| Tripoli                | 10 <i>Cc</i>                | 4 <i>Cc</i>                 | 3 <i>Cc</i>                 |                               | 17 <i>Cc</i>                 |
| PINR                   |                             |                             |                             | 2 <i>Cc</i> ?                 | 2 <i>Cc</i>                  |
| Cheikh-Zennad          | 8 <i>Cc</i>                 |                             |                             |                               | 8 <i>Cc</i>                  |
| Total                  | 62 <i>Cc</i> / 10 <i>Cm</i> | 36 <i>Cc</i> / 12 <i>Cm</i> | 27 <i>Cc</i> / 13 <i>Cm</i> | 8 <i>Cc</i> / 7 <i>Cm</i>     | 133 <i>Cc</i> / 42 <i>Cm</i> |

\*?: The sea turtles species have been identified based on some unclear morphological features due to the high decomposition of the body.



#### 4. Results related with marine litter ingested by the stranded marine turtles

A total of 33 stranded marine turtles (28 Cc and 5 Cm) were necropsied on the field/ or at the Tyre Coast Nature Reserve (TCNR) between January 2022 – July 2022.

Litter ingestion was recorded in the 25 sampled sea turtles with a total marine litter percentage of 28.06 % (Tab. 3). Within the marine litter categories, cigarettes with 40 items representing 27.40% were the most dominant, followed by industrial cylindrical/spherical granules with 35 items (23.97%), USE THR (majority fishing nets/ hooks and woven clothes) with 30 items (20.54%), and USE SHEE (especially plastic bags) with 26 items representing 17.80 %. The total dry weight of marine litter ingested by the dead sea turtles necropsied (33 individuals) was 11.96 g with an average of 0.36 g per individual. The mean weight differed among the litter categories as the most relevant was the USE THR with 5.25 g followed by USE FRAG with 3.08 g, USE SHE (2.15 g), IND (1.08 g) and finally the non-plastic rubbish with 0.40 g (Table 3).



**Figure 9.** Fishing nets found in the GI of a stranded marine turtles

**Table 3**

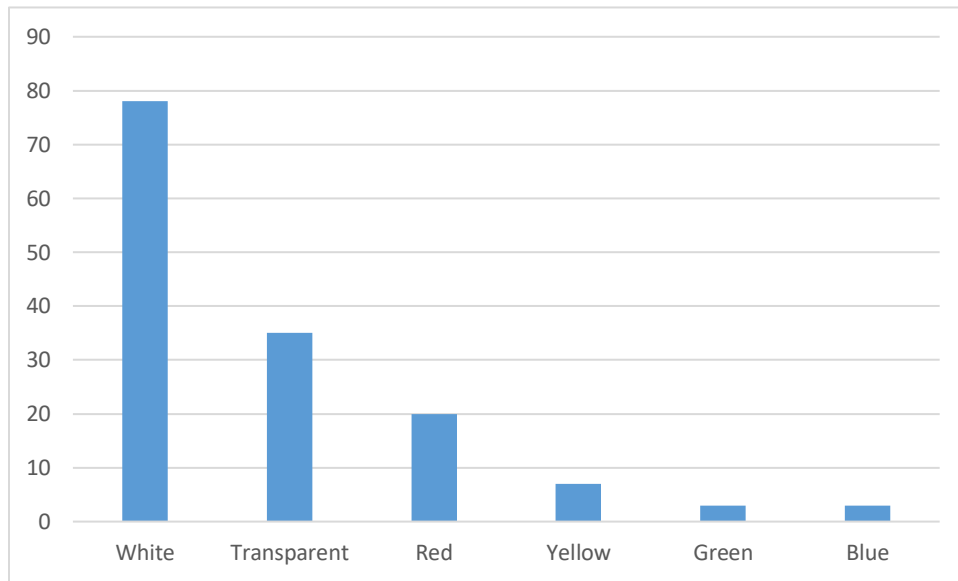
Results of ingested material (organic and marine litter) in the GI of the 28 *Caretta caretta* and the 5 *Chelonia mydas*

|  | <i>Caretta caretta</i> (n= 28) |            | <i>Chelonia mydas</i> (n= 5) |            | Total |
|--|--------------------------------|------------|------------------------------|------------|-------|
| <b>Organic material</b>                                    | N                              | Weight (g) | N                            | Weight (g) |       |
| FOO (natural food)   | -                              | 42.09      | -                            | 6.18       | 36.27 |
| NFO (natural no food)                                      | -                              | 26.05      | -                            | 7.01       | 24.06 |
| Total of organic matter                                    | -                              | 68.14      | -                            | 13.19      | 60.33 |
| <b>Marine Litter</b>                                       |                                |            |                              |            |       |
| IND (Industrial cylindrical/spherical granules)            | 28                             | 0.87       | 7                            | 0.21       | 1.08  |
| USE SHE (majority industrial packages and bags)            | 22                             | 1.82       | 4                            | 0.33       | 2.15  |
| USE THR (majority fishing nets/ hooks and woven clothes)   | 24                             | 4.20       | 6                            | 1.05       | 5.25  |
| USE FOA (majority soft fragment)                           | -                              | -          | -                            | -          | -     |
| USE FRA (e.g. bottle caps, cups, gloves..)                 | 10                             | 2.05       | 5                            | 1.03       | 3.08  |
| USE POT Any others (e.g. elastics, dense rubber, ballon..) | -                              | -          | -                            | -          | -     |
| Others (cigarette, newspapers)                             | 33                             | 0.33       | 7                            | 0.07       | 0.40  |



|   |            |              |           |              |              |
|---|------------|--------------|-----------|--------------|--------------|
| <b>Total of marine litter</b>             | <b>117</b> | <b>9.27</b>  | <b>29</b> | <b>2.69</b>  | <b>11.96</b> |
| <b>Sum of the total ingested material</b> | -          | <b>77.41</b> | -         | <b>15.88</b> | <b>93.29</b> |
| <b>% marine litter</b>                    | -          | <b>11.97</b> | -         | <b>16.09</b> | <b>28.06</b> |

Subsequently, the ingested litter categories differed also among colors. White items were the most abundant and presented higher values than the other colors with 78 items representing 53.42 %, followed by transparent (23.97 %) and red/yellow/green/blue (22.60%) were also quite abundant (Figure 10).



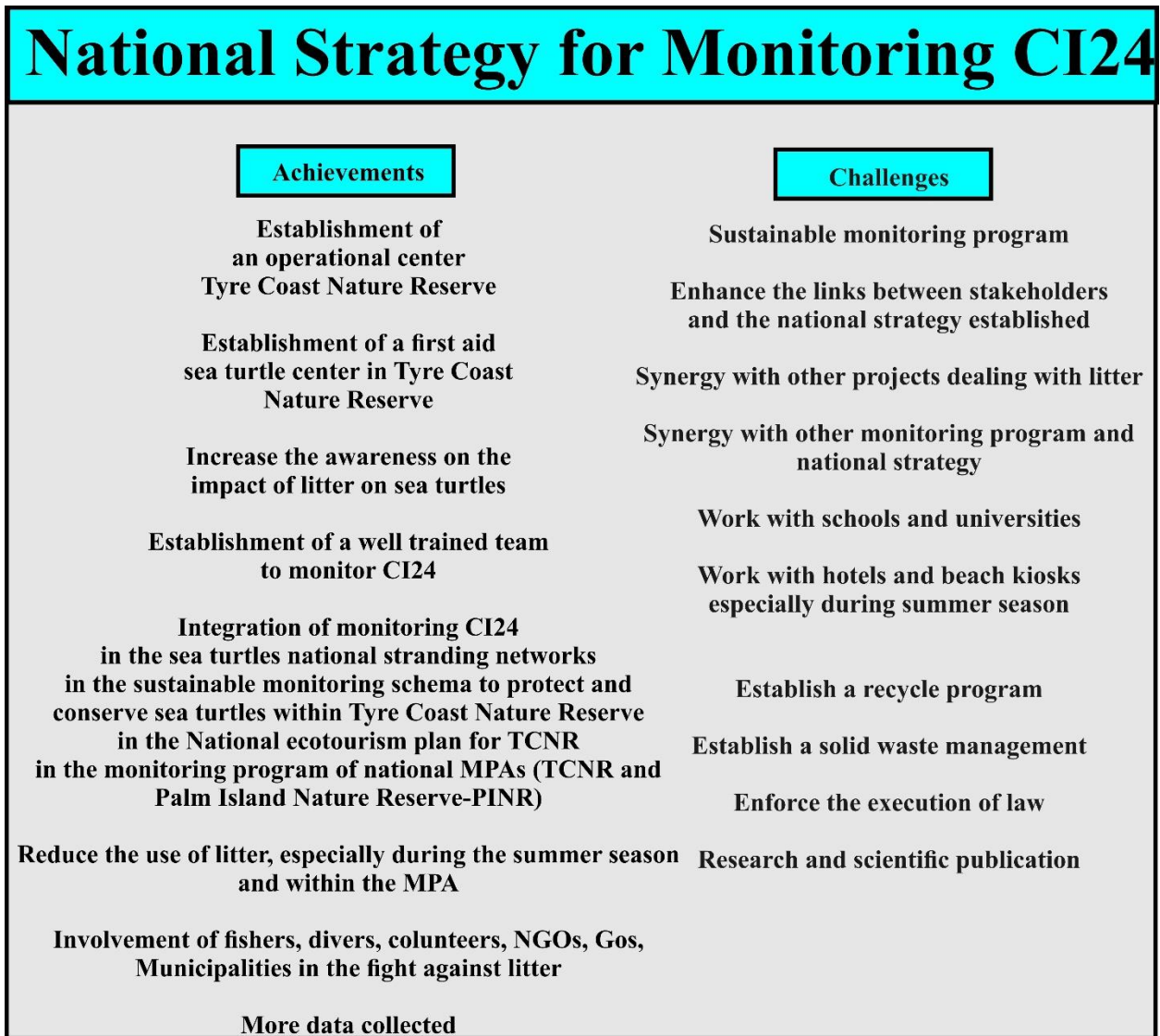
**Figure 10.** Litter color distribution. Litter items ingested (n = 89 items) are subdivided into different color categories.

## 5. Conclusion and recommendations

The National Strategy for monitoring CI24 is giving results along the Lebanese coast. However, more works are needed for the development of the program (Table 4 and Fig. 11), especially:

- Guarantee a sustainable monitoring program by including the National Strategy in the program of the MPAs (especially within Tyre Coast Nature Reserve as the National Marine Turtles MPA)
- Work more with the municipalities to take some decisions allowing reduce the use of marine litter (even if it should be important to apply the law any pollutant should pay)
- Organize the collection of data (by more cooperation between research institutes and Universities and independent national expert)
- Guarantee a sustainable training program for local communities
- Enhance the connection between researchers and fishers and divers
- Continue the work on making accessories (handmade) made by plastic
- Focusing on the awareness to reduce the use of plastics especially during summer
- Try to apply the law “Polluant-Payeur”, especially within the MPAs

- Focusing on the awareness and sensibilization by making more brochures and posters and share them with kids/ students/ kiosks/ hotels.
- Focusing on the application of the Ecotourism plan based on sea turtles and find a synergy with the National Strategy for Monitoring CI24.
- Focusing on the capacity building process (especially within the MPAs)
- Focusing on the communication and visibility part



**Figure 11.** The National Startegy For Monitoring CI24 Achievements and Challenges

**Table 4**

Actions proposed in the National strategy for monitoring IMAP Candidate Indicator 24 and the progression done

| Actions   | Targets   | Progress   |
|---|---|--|
| Establishment of a sea turtles rescue sea turtles   | By 2027, Lebanon have a sea turtle rescue center well established and equipped  | Done- a first aid sea turtle rescue center has been well established in Tyre Coast nature Reserve-TCNR   |
| Establishment of a sea turtles stranding networks   | By 2027, Lebanon have a well-established and developed stranding network for sea turtle   | Done the sea turtles stranding networks is well established and developed. In addition, the sea turtles stranding networks is also following any stranded cetaceans incidents. However, it is programmed to establish a well trained team ready to intervene for any stranded sea turtles incidents (ongoing).   |
| Development and update and standardize the marine litter on sea turtle protocol and monitoring                    | By 2027, Lebanon have a well-established and developed and standardized protocol to monitor the impact of marine litter on sea turtles  | Done. The methods for monitoring CI24 is well established and clear and the collection of data is ongoing.   |
| Development of the awareness campaign to protect the sea turtle from the marine litter pollution                  | By 2027:<br>More than 70 % of Lebanese people will know about the sea turtles monitoring and conservation program.<br>Ecovolunteers, NGOs, local communities would be involved in the monitoring and conservation program<br>Use of items made by plastic will be reduced   | The Lebanese communities (especially NGOs, GOs) knows about the sea turtles rescue center of TCNR and the program of monitoring Plastic (especially after establishing a synergy with other national projects dealing with marine litter).<br>The number of volunteers, NGOs, local communities are now well involved in the monitoring porogram due to the training campaign launched.<br>More works is needed (especially funds) to replace plastic items by other environmental ones. |
| Development of researches and studies to reduce the effect of marine litter on sea turtles in the Lebanese waters | By 2027:<br>Much research on marine litter concentration in the Lebanese waters and the sandy beach and their impact on marine taxa will be performed<br>Developed techniques to reduce the marine litter impacts will be performed<br>National/ International projects dealing with marine litter pollution will be launched<br>Data collected will be banked within the MoE | Researchs are ongoing, and papers are prepared to be published in international journal and presented in international symposium in cooperation with the SPA/RAC<br>Cooperation with Municipalities and MoE and MoA is ongoing to find some policies reducing the use of marine litter   |
| Enforce the existing law protecting the sea turtles in Lebanon  | By 2027, the sea turtles will be fully protected by law and taxes will be imposed to pollutant  | Work with Municipalities and MPAs, in cooperation with MoE, and MoA, is ongoing  |
| National ecotourism plan based on sea turtles   | By 2027, Lebanon will have a well-established ecotourism plan based on sea turtles  | Work with Municipalities and MPAs is ongoing, and the the Ecotourism strategy based on sea turtles elaborated for Tyre Coast Nature Reserve-TCNR,  |

|   |  |  |
|---|--|--|
|   |  | SPA/RAC-UNEP/MAP, 2021b is started to be developed by the application of some activities proposed in the National ecotourism plan based on sea turtles |
| <b>Marine litter cleaning campaign</b>                                | By 2027:<br>Sandy beach (as potential nesting sites) will be totally cleaned from marine litter, especially before the nesting sea turtles season<br>Marine litter (especially ghostnets) in the Lebanese sea bottom will be reduced | Synergy with other project ongoing dealing with marine litter is strated to be established to fill this activity                                       |
| <b>Improve the disposal and management of the country solid waste</b> | By 2027, Lebanon develop and update a roadmap for plastic waste management   | Work with Municipalities and MPAs is ongoing   |
| <b>Cooperate with Mediterranean experts</b>                           | By 2027, Lebanon has links with other Mediterranean countries and projects (regional/ international) working with the impact of marine litter on sea turtles   | Collaboration with Mediterranean experts are ongoing   |

## Annexes

## Annex 1

### Principal equipment of the stranding networks for sea turtles

Principal Equipment's needed for the stranding networks and necropsy

- Protective suit
- Glasses and protective mask
- Gloves
- Camera
- Measuring tape
- Observation sheet
- Bottle/zippered bags
- Permanent marker
- Ice box
- Garbage bag

Equipment's needed at the field

- Scissors
- Cattle
- Sieve 1 mm mesh
- Cylinder for volume measuring
- Measuring sheet

Equipment's needed at the Lab

It is important, during all the process to conserve the hygiene conditions to avoid any contamination.

Annex 2

The observation sheet to complete in case of a stranding incident of sea turtle and cetaceans along the Lebanese coast

| <b>Observation sheet</b>   |  |   |
|--|--|---|
| <b>Informations about the collector</b>  |  |   |
| Name.....  |  |   |
| <b>Profession</b>  |  |   |
| <input type="checkbox"/> Fishermen<br><input type="checkbox"/> NGOs<br><input type="checkbox"/> Public<br><input type="checkbox"/> Volunteers<br><input type="checkbox"/> Public<br><input type="checkbox"/> Owner of kiosk/Private sectors<br><input type="checkbox"/> Others<br>Phone..... |  |   |
| <b>Informations about the first responder</b>  |  | <b>Marine expert informations</b><br>Name:.....<br>Expertise:.....  |
| <input type="checkbox"/> Marine Reserve of Tyre<br><input type="checkbox"/> Marine Reserve of Tripoli (Palm Island)<br><input type="checkbox"/> National Center for Marine Sciences<br><input type="checkbox"/> Others   |  |   |
| <b>Informations about the stranded sea turtles/cetaceans</b>   |  |   |
| Location   | Latitude   | Longitude   |
| .....  | .....  | .....   |
| <b>Sea turtles species</b>   |  |   |
| <input type="checkbox"/> <i>Caretta caretta</i> (Loggerheads)<br><input type="checkbox"/> <i>Chelonia mydas</i> (Green turtles)<br><input type="checkbox"/> Others   |  |   |
| <b>Dolphins species</b>  |  | Tagging <input type="checkbox"/> Yes <input type="checkbox"/> No<br>Email.....<br>Tag number.....   |
| <input type="checkbox"/> <i>Tursiops truncatus</i> (Bottlenose)<br><input type="checkbox"/> <i>Stenella coeruleoalba</i> (Striped dolphin) <input type="checkbox"/> Others   |  |   |
| <b>Picture</b> <input type="checkbox"/> Yes <input type="checkbox"/> No  |  |   |
| <b>Circumstances</b><br><input type="checkbox"/> Stranding<br><input type="checkbox"/> Bycatch<br><input type="checkbox"/> Found at the sea<br><input type="checkbox"/> Other  | <b>Injuries</b><br><input type="checkbox"/> No injuries<br><input type="checkbox"/> Fracture<br><input type="checkbox"/> Amputation<br><input type="checkbox"/> Sectioning<br><input type="checkbox"/> Abrasion<br><input type="checkbox"/> Entanglement | <b>Conservation status</b><br><input type="checkbox"/> Alive<br><input type="checkbox"/> Freshly dead<br><input type="checkbox"/> Partial<br><input type="checkbox"/> Advanced<br><input type="checkbox"/> Mummified<br><input type="checkbox"/> Others |
| <input type="checkbox"/> By fishing nets<br><input type="checkbox"/> Litter  |  |   |
| <b>Biometric measurements</b>  |  |   |
| Curved carapace length.....  |  |   |
| Curved carapace width.....   |  |   |



### Annex 3

#### Sheet of the measurements of the ingested inorganic and organic materials of a necropsied sea turtles

##### Marine Litter Measurements (dry mass, number of fragments and items and colors)

|                | <b>Oesophagus</b> |                     |                 |        | <b>Stomach</b> |                     |                 |        | <b>Intestines</b> |                     |                 |        | <b>Facies</b> |                     |                 |        |
|----------------|-------------------|---------------------|-----------------|--------|----------------|---------------------|-----------------|--------|-------------------|---------------------|-----------------|--------|---------------|---------------------|-----------------|--------|
|                | Dry mass          | Number of Fragments | Number of Items | colors | Dry mass       | Number of Fragments | Number of Items | colors | Dry mass          | Number of Fragments | Number of Items | colors | Dry mass      | Number of Fragments | Number of Items | colors |
| <b>FOO</b>     |                   |                     |                 |        |                |                     |                 |        |                   |                     |                 |        |               |                     |                 |        |
| <b>NFO</b>     |                   |                     |                 |        |                |                     |                 |        |                   |                     |                 |        |               |                     |                 |        |
| <b>Total</b>   |                   |                     |                 |        |                |                     |                 |        |                   |                     |                 |        |               |                     |                 |        |
| <b>IND</b>     |                   |                     |                 |        |                |                     |                 |        |                   |                     |                 |        |               |                     |                 |        |
| <b>USE SHE</b> |                   |                     |                 |        |                |                     |                 |        |                   |                     |                 |        |               |                     |                 |        |
| <b>USE THR</b> |                   |                     |                 |        |                |                     |                 |        |                   |                     |                 |        |               |                     |                 |        |
| <b>USE FOA</b> |                   |                     |                 |        |                |                     |                 |        |                   |                     |                 |        |               |                     |                 |        |
| <b>USE FRA</b> |                   |                     |                 |        |                |                     |                 |        |                   |                     |                 |        |               |                     |                 |        |
| <b>USE POT</b> |                   |                     |                 |        |                |                     |                 |        |                   |                     |                 |        |               |                     |                 |        |
| <b>OTHER</b>   |                   |                     |                 |        |                |                     |                 |        |                   |                     |                 |        |               |                     |                 |        |



United Nations  
Environment Programme



Mediterranean Action Plan  
Barcelona Convention



*The Mediterranean  
Biodiversity  
Centre*

Specially Protected Areas Regional Activity Centre (SPA/RAC)  
Boulevard du Leader Yasser Arafat - B.P. 337 - 1080 Tunis Cedex - Tunisia  
Tel: +216 71 206 649 / 485 | [car-asp@spa-rac.org](mailto:car-asp@spa-rac.org) | [www.spa-rac.org](http://www.spa-rac.org)

