

# COastal Management and MOnitoring Network

*for tackling marine litter in Mediterranean sea*



Study area description

The University of Siena is collecting information on the different study areas in order to highlight possible common characteristics and plan the future sampling activities. The main goal of this procedure is to harmonize the results and to maximise the efficiency of the sampling protocols in all areas.

*- This is an example of the information required from each partner to be filled in regarding the target study area within the COMMON project.*

COLUMN	REQUIRED INFORMATION
<b>Name of the area</b>	Report the name of the sampling area (i.e. state, region, municipality, island, etc..)
<b>Implementing partner</b>	Report the name of the partner involved
<b>Brief description of the area</b>	Write briefly the main features of the study area (i.e. surface, coastline, etc..)
<b>Anthropogenic pressure on the area</b>	Note the most relevant impact in the area (i.e. urban areas, industrial settlements, commercial ports etc..)
<b>Rivers in the area</b>	Report the main rivers in the area
<b>Harbours present in the area</b>	Report the main harbours in the area
<b>Sea area delimitation</b>	Note if there are legal limits for sampling offshore (Sampling will be done within 6 nautical miles)
<b>Map of the area</b>	Attach a map of the study area
<b>Protected zone in the area (National Parks, SICs, ZPS)</b>	Note if there are any protected zone in the study area
<b>Municipalities included</b>	Write all the municipalities included
<b>Potential beaches for sampling activities</b>	Report all the suitable beaches for sampling activities
<b>Microplastics sampling foreseen</b>	3 sampling sites, 3 transects for each sampling site. Distance to the coast: 6 nautical miles, 3 nautical miles, 1.5 nautical miles.
<b>Permits required for sampling activities</b>	Record the necessary permits to carry out the different typologies of sampling (e.g. Coast Guard for boarding researchers, navy, etc.)
<b>Turtles rescue center present in the area</b>	Note the turtles rescue center present in the area

## COMMON STUDY AREAS

Name of the area	Implementing partner	Sea area delimitation for sampling	Microplastics sampling foreseen	Permits required for sampling activities
Maremma, Italy	University of Siena, Legambiente	6 nautical miles	3 sampling sites, 3 transects for each sampling site. Distance to the coast: 6 nautical miles, 3 nautical miles, 1.5 nautical miles.	Coast Guard for boarding researchers
Salento, Italy	CIHEAM Bari	6 nautical miles	3 sampling sites, 3 transects for each sampling site. Distance to the coast: 6 nautical miles, 3 nautical miles, 1.5 nautical miles.	
“La Grande Kuriat” island	National Institute of Marine Sciences and Technology. Tunisia.	6 nautical miles	3 sampling sites, 3 transects for each sampling site. Distance to the coast: 6 nautical miles, 3 nautical miles, 1.5 nautical miles.	
Monastir	National Institute of Marine Sciences and Technology. Tunisia.	8 nautical miles	3 sampling sites, 3 transects for each sampling site. Distance to the coast: 6 nautical miles, 3 nautical miles, 1.5 nautical miles.	
Tyre Coast	Tyre Coast Nature Reserve (TCNR)	6 km	3 sampling sites, 3 transects for each sampling site. Distance to the coast: 6 km, 3 km, 1.5 km	Coast Guards and Lebanese army for boarding researchers

## Maremma (ITALY)

**Name of the area:** Maremma

**Implementing partner:** University of Siena, Legambiente

**Brief description of the area:** The Tuscan Maremma is a historical region of central western Italy of remarkable ecological and landscape value, with a surface of about 4.420 km<sup>2</sup> (Selvi, 2010). Since the times of Dante Alighieri, the term “Tuscan Maremma” is traditionally used to indicate the coastal and sub coastal plains and hills of central and southern Tuscany, from the lower river Cecina valley in the Pisa province (*Maremma Pisana*) to the mouth of the *Chiarone* river in the lower Grosseto province. The Maremma coast is about 180 km long and is included in the North Tyrrhenian Sea/ Ligurian Sea (FAO Geographical Sub Area - 9). The GSA-9 covers 42,410 km<sup>2</sup>, it is characterized as one of the most important Mediterranean areas of upwelling and with great biodiversity (Relini, 2007).

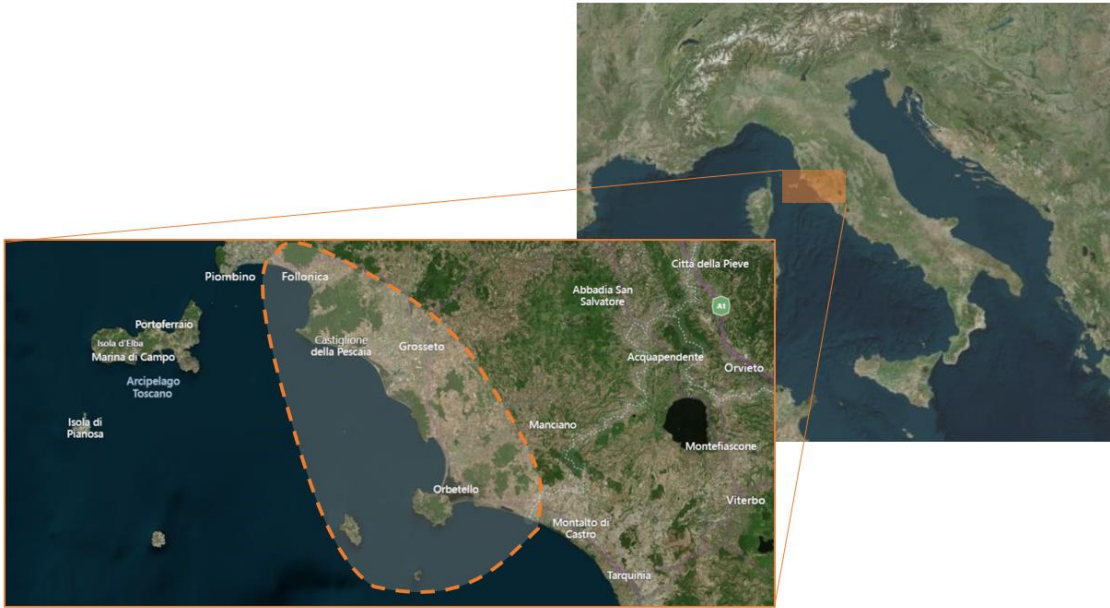
**Anthropogenic pressure on the area:** Regarding the anthropogenic pressure, the GSA-9 is strongly anthropized, with large urban areas, industrial settlements and commercial ports. On the northern area, there are two main possible plastic pollution sources: Leghorn is one of the largest Italian touristic, maritime and commercial ports, with 30 million tonnes of cargo and 2 millions of people, and the Arno, one of the largest Italian rivers (Cincinelli et al., 2001). Other important inputs can derive from the Piombino harbour and minor rivers (e.g. Ombrone).

**Rivers in the area:** Pecora, Bruna, Ombrone and Albegna

**Harbours present in the area:** Scarlino, Castiglione della Pescaia, Marina di Grosseto, Talamone, Porto Santo Stefano, Porto Ercole

**Sea area delimitation:** Sampling will be done within 6 nautical miles.

**Map of the area:**



## Maremma

### Protected zone in the area (National Parks, SICs, ZPS, etc.):

Oasi WWF Burano, Parco Regionale della Maremma

**Municipalities included:** Follonica, Scarlino, Castiglione della Pescaia, Grosseto, Magliano in Toscana, Orbetello, Monte argentario, Capalbio.

**Potential beaches for sampling activities** (List of beaches present in the area that have the characteristics required by the sampling protocol) (100mt):

- Follonica
- Scarlino
- Punta Ala
- Le Rocchette
- Castiglione della Pescaia
- Marina di Grosseto
- Marina di Alberese
- Osa
- Albinia
- Spiaggia della Giannella
- Spiaggia della Feniglia/Ansedonia
- Burano
- Spiaggia di Capalbio



**Microplastics sampling foreen:** 3 sampling sites, 3 transects for each sampling site. Distance to the coast: 6 nautical miles, 3 nautical miles, 1.5 nautical miles.

**Permits required for sampling activities:** Record the necessary permits to carry out the different typologies of sampling (e.g. Coast Guard for boarding researchers, navy, etc.)

**Turtles rescue centre present in the area:** CRTM Talamone, Tartamare (first aid center)



## SALENTO (ITALY)

**Name of the area:** Salento (eastern coastline between Tricase Porto and Castro Marina which includes the Municipalities of Tricase, Andrano, Diso and Castro )

**Implementing partner:** CIHEAM Bari

**Brief description of the area:** The eastern coast of Salento (Lecce province, southern Apulia, Italy) is a remarkable geological area stretching from Otranto to Leuca villages. It retains a valuable geological heritage produced by the main geological events occurred in the Mediterranean area since Cretaceous (S. Margiotta, P. Sansò, 2010). The coastal area taken into account which includes the territories of 4 municipalities (Tricase, Andrano, Marittima di Diso and Castro) is included into a sustainable territorial development strategy supported by Regione Puglia program through the institution of the Regional Natural Otranto - Santa Maria di Leuca Coast and Tricase Woodland Park (n.30 Puglia Regional law of 26/10/2006), including some SCI (Habitat 92/43/CE) and having a consortium for the management. The Regional Natural " Otranto - Santa Maria di Leuca Coast and Tricase Woodland Park " which covers a surface of 3,227 hectares, and with an area of about 57 km along Salento's eastern coast, represents the biggest among the regional parks established in the province of Lecce. Furthermore, the coastal stretch taken into account is about 19 km long, where it is located a regional interest site: the Port Museum of Tricase. The Ecomuseum has been recognize with resolution no. 1182/2017 of the Regional Council, pursuant to Regional Law n. 15/2011, following the favourable opinion expressed by the Regional Council for Eco-museums, under decision of the Tourism Department, Economy of Culture and of the Puglia Region Territory Enhancement. The area is included in the Western Ionian Sea (FAO Geographical Sub Area – 19). The geomorphology of the area is characterized by cliffs, rocky stretches and the presence of a large number of caves (D'Ambrosio et al., 2006). Along the GSA-19 many submarine canyons are located (Rossi & Gabbianelli, 1978), which can act as "ecological refuge" for many bathyal and endemic species constituting "hot-spots" of biodiversity in the Mediterranean Sea where conservation measures are needed (Gili et al., 1998).

**Anthropogenic pressure on the area:** Regarding the anthropogenic pressure, the area is lightly anthropized, with small urban areas and touristic ports.

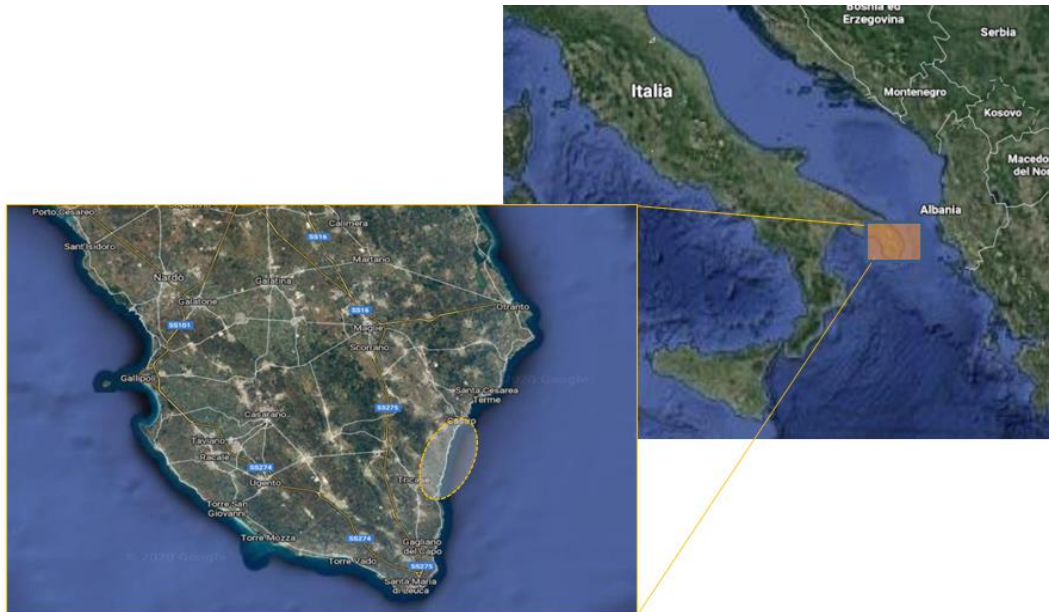
Along the area under consideration, there are two touristic ports and one slipway which could be represent the main possible plastic pollution sources: the first two are located in Castro and Tricase which also represent the areas with greater touristic activity; the slipway is located in Andrano (D'ambrosio et al., 2006). Although Marittima di Diso is not a marine area with high touristic activity, could also be another source of pollution.

**Rivers in the area:** There are no rivers in the area.

**Harbours present in the area:** Porto di Tricase and Castro.

**Sea area delimitation:** Sampling will be done within 6 nautical miles.

**Map of the area:**



**Salento eastern coast**

**Protected zone in the area (National Parks, SICs, ZPS, etc.):**

Regional Natural Park "Costa Otranto - S. Maria Leuca - Bosco Tricase"

**Municipalities included:** Tricase, Andrano, Diso, Castro

**Potential beaches for sampling activities:**

The coast is mainly rocky and has no sandy beaches. On the basis of the territory's knowledge and through the literature's studies, we are trying to identify a methodology which can allow this activity on our territory or adapt the shared one among the partners. Accordingly, we will identify accessible, safe and suitable areas according to the methodology to be adopted for this activity's implementation.

**Microplastics sampling foreen:** 3 sampling sites, 3 transects for each sampling site. Distance to the coast: 6 nautical miles, 3 nautical miles, 1.5 nautical miles.

**Permits required for sampling activities:** Record the necessary permits to carry out the different typologies of sampling (e.g. Coast Guard for boarding researchers, navy, etc.)

**Turtles rescue centre present in the area:** Calimera Sea Turtle Rescue Centre (Le)



## MONASTIR (TUNISIA)

**Name of the study area 1:** Monastir

**Name of the study area 2:** “La Grande Kuriat” island

**Implementing partner:** National Institute of Marine Sciences and Technology. Tunisia.

**Brief description of the area 1:** Monastir is located in the Eastern part of Tunisia (central Mediterranean). It covers an area of 1019 km<sup>2</sup> (FAO Geographical Sub Area - 13). Its population is about 548,828 (2014). It extends for 38 km of littoral and about 130 square nautical miles of surface waters, with a complex shoreline. The coastline is experiencing significant erosion in its northern part at the site of the former salt marshes but with beach formation in its southern part at the level of the dyke. The Monastir beach is characterized by a small stretch of sandy beach which disappears in local area by the effect of erosion. Another part of rocky beach which is extended around the cliff of Monastir. Monastir marine ecosystem is characterized by two main environments; a coastal environment with a predominantly muddy bottom containing high biomass of nitrophilic algae under eutrophic conditions and a second relatively balanced offshore ecosystem on a sandy bottom with a fairly diverse flora, largely dominated by *Posidonia* meadows and a fauna with a relatively high level of biodiversity (APAL, 2010). The underwater morphology with very low zones between Khnis and Lamta as well as the Ras Dimas - Kuriat Islands cordon considerably reduce the effects of waves coming from the open sea contributing to the increase of pollutants and marine litter concentration in the sea (Souissi et al., 2014).

**Brief description of the area 2:** The “La Grande Kuriat” island located northeast of Cape Monastir is an uninhabited island, located in the the Golf of Hammamet (GSA 13), about 20 km from the mainland with a total shoreline of about 8.34 km and covering about 270 ha. It is characterized by a flat and low morphology with a coastline of the Kuriat islands is characterized by a rocky coast of low altitude (<2m) in the North and Northeast sectors); and sandy beaches in the southern and eastern part. This island is sheltering species threatened by distinction (the loggerhead turtle *Caretta caretta*, *Meager gull*, *Pinna nobilis* and the plant *Caulerpa racemosa*). This particular marine costal environment has earned it the status of a sensitive coastal zone (following the census of biological diversity in Tunisia conducted by Tha ministry of Environment and regional Planing in 2005) and is currently (with the small Kuriat : Conigliera) of the program of creation of Marine and Coastal Protected Area (MCPA) in Tunisia (SPA/RAC-PNUE-PAM 2017, 2019)

**Anthropogenic pressure on the area 1:** Monastir is characterised by a continuous urban extension including several activities. The litoral zone is now a major tourist resort with an attractive marina and touristic zone. Recent decades urban activity increased around industrial and touristic areas. The degradation of the

coastal fringes is mainly associated with a strong accumulation of organic matter localised within a poorly hydrodynamic, in shallow water environment. The ecological equilibrium of this area is in constant degradation. In fact, this area is characterised by the economic development of industry (mainly in the textile sector) which have undergone significant geographical expansion since the 1950s in conjunction with urban development. Several constructions, towns, industries, five fishing ports (Skanes, Monastir, Ksibet El Mediouni, Sayada and Teboulba) and wastewater treatment plants border the coast of Monastir, creating strong environmental pressure. The continuing development of aquaculture in this area is also having a sizeable impact on the area. Since 2018, the aquaculture sector has undergone an important turning point, with the establishment of eleven active offshore fish farms ( Ruspina, aquamed, Rafaha, Sahel Aquaculture, Prima Fish, TTF, Siren, Hanchia...) covering an overall marine area of about 70,000 ha, with about 400 ha of concession area (APAL, 2015). Several construction works have been carried out to connect the drain to the Oued El Melah: the main watercourse in the region which collects domestic and industrial wastewater from the riverside towns. The allochthonous inputs in Monastir are driven by fresh and waste-waters. Wastewaters are discharged directly in the sea via two wastewater of the El Frina and the Lamta-Sayada treatment plants stations. The average daily discharge of wastewater flow are 6500 m<sup>3</sup> at El Frina station and 3000 m<sup>3</sup> at Lamta-Sayada station (Damak et al., 2019). Freshwaters are mainly drained via the Khniss drain that is in the same time collect industrial and domestic wastewaters.

**Anthropogenic pressure on the area 2:** Regarding the anthropogenic pressure, the large number of aquaculture farms and the intense maritime traffic between the different Harbours, Marina and Aquaculture farms can facilitate the spread of marine litter. Moreover, the proximity of floating cages From Kuriat Island (about 4 km for Prima fish, STEP and Hanchia farms) does increase the risk of the marine litter transportation mostly plastic marine debris into the Islands area.

**Rivers in the area 1:** Oued Khnis, Oued Essouk

**Harbours present in the area 1:** Skanes, Marina (Cap Monastir), Monastir, Ksibet El Mediouni, Sayada, Teboulba.

**Sea area 1 delimitation:** Sampling will be done within 8 nautical miles.

**Sea area 2 delimitation:** Sampling will be done within 6 nautical miles.

**Map of the study area 1 (Monastir) and the study area 2 (Grande kuriat island) :**



### Monastir and Grande Kuriat Island

#### **Protected zone in the area 1 (National Parks, SICs, ZPS, etc.):**

Sahline salt pans, Kuriat Islands

#### **Protected zone in the area 2 (National Parks, SICs, ZPS, etc.):**

La Grande Kuriat Island

**Municipalities included area 1:** Amiret El Fhoul, Amiret Hajjaj, Amiret Touazra, Bekalta, Bembla, Beni Hassen, Bennane-Bodheur, Bouhjar, Cherahil, El Ghnada, El Masdour, Jemmal, Khniss, Ksar Hellal, Ksibet el-Médiouni, Lamta, Menzel Ennour, Menzel Fersi, Menzel Hayet, Menzel Kamel, Moknine, Monastir, Ouerdanine, Sayada, Sahline-Moûtmar, Sidi Ameur, Sidi Bennour, Téboulba, Touza, Zaouiet Kontoch, Zéramdine.

#### **Municipalities included area 2:**

**Potential beaches for sampling activities area 1** (List of beaches present in the area that have the characteristics required by the sampling protocol) (100mt):

- Skanes Palmiers
- La falaise
- Marina
- El Karaya



**Potential beaches for sampling activities area 2** (List of beaches present in the area that have the characteristics required by the sampling protocol) (100mt):

- Rocky and sandy beaches of the island

**Microplastics sampling foreen:** 3 sampling sites, 3 transects for each sampling site. Distance to the coast: 6 nautical miles, 3 nautical miles, 1.5 nautical miles.

**Permits required for sampling activities:** Record the necessary permits to carry out the different typologies of sampling (e.g. Coast Guard for boarding researchers, navy, etc.)

**Turtles rescue centre present in the area:** Tunisian sea turtle rescue centre . INSTM. Monastir

## Tyre Coast Nature Reserve (LEBANON)

**Name of the area:** Tyre Coast

**Implementing partner:** Tyre Coast Nature Reserve (TCNR)

**Brief description of the area:** Tyre Coast Nature Reserve (TCNR) is located immediately south of city of Tyre, South Lebanon. TCNR is one of the two declared Marine Reserves in Lebanon (another two new marine reserves have been declared recently -March 2020- in Lebanon) and recognized as the most beautiful and largest last remaining sandy beach in Lebanon. TCNR may be considered rare of its kind in Lebanon and subsequently has a great natural heritage value and was created in 1998 by Law No. 708.

Its biodiversity derives from several elements that are grouped in a small terrestrial area of 3.8 km<sup>2</sup>. TCNR also has the right to protect a marine surface area (territorial waters) of about 113 km<sup>2</sup>. It is characterized by its ecological, marine and coastal ecosystem. In addition, it is an important nesting site for migratory birds and the threatened sea turtles, within a diversity of ecosystems comprising a wide variety of flora and fauna species. The lands constituting the reserve, amount to an area of 380 ha divided into three zones: Touristic zone, Agricultural & Archeological zone, and Conservation zone. The natural reserve contains fresh water estuaries and springs that outflow to the sea, thus creating a fresh/marine water interface. Both visitors and scientists recognize it as one of the most beautiful and scenic beaches in Lebanon, with the widest biodiversity.

**Anthropogenic pressure on the area:** Regarding the anthropogenic pressure, the area is somehow anthropized, with presence of domestic/urban areas and the heavy touristic activities during the summer season.

TCNR is a protected area considering its 3 zones: touristic zone, conservation zone, agricultural & archeological zone.

Along the area under consideration, there is the tourism zone could represent the main possible plastic pollution source, in which the beach is opened to the public for beach recreational activities during the summer season, and temporary wooden kiosks along the entire beach area offer food and recreational services to the tourists. The number of visitors is estimated at 700,000 tourists during the summer, who frequent the beach mostly during the weekends. In addition, the Rachidiye Palestinian refugee camp, located between the conservation and agricultural zones, with condensed urban settlements near the shoreline, could be considered also as another source of litter and ecological degradation.

The conservation zone is highly protected zone to minimize the disturbance to wildlife, hence it has no anthropogenic pressure.

The agricultural & archeological zone is less anthropized. It includes the Phoenician springs of Ras El-Ain and a large area where agriculture remains an economic livelihood for many small family farms.

**Rivers in the area:** The estuary that flows out from the springs of Ras El Ain (agricultural zone), and the Kassmyeh river (river mouth of Litani river), 6 km north to Tyre.

**Harbours present in the area:** Tyre fishermen port.

**Sea area delimitation:** Sampling will be done within 6 km (max) from the shoreline, with a permit from the sea guards and the Lebanese army.

**Map of the area:**



Brochure showing the delimitation of the 3 terrestrial zones of the reserve



# Welcome to Tyre Coast Nature Reserve أهلا بكم في محمية شاطئ صور الطبيعية



**Legend:**

- You are here
- TCNR Visitor Centre
- Touristic Zone
- Conservation Zone
- Agricultural & Archeological Zone
- Bird hide
- Sea turtle nesting area
- Flora
- Water ponds & reed beds
- Sand dunes
- Entry
- Trail 1
- Trail 2

**Visitor Centre of TCNR**

**Touristic Area**

**Conservation Area**

**Agricultural Area**

**TCNR Welcomes You:**

- TCNR Visitor Center is open all year round from Monday to Friday from (8:00-18:30).
- The Conservation /Agricultural & Archeological zones are open all year round from (8:00 - 17:30) upon reservation.
- Touristic recreation zone is open during Summer season.

For more details Visit our website: [www.tcnr-leb.com](http://www.tcnr-leb.com)

Take only MEMORIES . Leave only FOOTPRINTS

لا تأخذ سوى الذكري . ولا تخلف سوى آثار الأقدام



**Noticing**  
**Informing**  
**Protecting**

If you see a stranded or injured sea turtle  
Please contact the Sea Turtle Rescue Centre in TCNR  
Tel: 00981-3-876837  
Email: [tcnr9@hotmail.com](mailto:tcnr9@hotmail.com)

## Information Panel highlighting the different terrestrial zones of TCNR



Extension of the marine zone (12 nautical miles in the sea) across the terrestrial zones

**Protected zone in the area (National Parks, SICs, ZPS, etc.):**

Tyre Coast Nature Reserve which includes the following assets :

- The touristic zone, conservation zone, agricultural & archeological zone.
- Designated Ramsar site for having wetlands of international importance by the Ramsar Convention on Wetlands.
- Designated SPAMI (Specially Protected Area with Mediterranean Importance) since 2013.



- Many species of plants and marsh birds.
- Last existing Sand dunes' Ecosystem in Lebanon
- The nesting site for the endangered Loggerhead and Green sea turtles.
- The agricultural and archeological zone includes the Phoenician-Roman springs of Ras El-Ain (dating back to 5,000 years ago), artesian wells, source of fresh water supplying the city of Tyre and its surrounding villages with domestic water, and the agricultural zone near the archeological zone with irrigation water.

**Municipalities included:** Tyre municipality.

**Potential beaches for sampling activities:** The beach of TCNR, and potentially the other sandy public beach of Tyre, north to TCNR and the Rest House. If needed, sampling from the Kassmyeh river mouth could be conducted, for its crowdedness in plastic ML (plastic bottles and other plastic items, brought-by with the sea current and its waves, settling on the shoreline at the southern bank of the river mouth), which is situated 6 km north to Tyre city (about 8-9 km north to the pilot area)

**Microplastics sampling foreseen:** 3 sampling sites, 3 transects for each sampling site.

Distance to the coast: 6 km, 3 km and 1.5 km from the shoreline.

**Permits required for sampling activities:** Coast Guards and Lebanese army for boarding researchers

**Turtles rescue centre present in the area:** TCNR Turtles rescue center (turtles' first aid center).