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PREFACE

The survey focused on the areas of Oum Toyour and Ras El Bassit, as noted in the contract (Figure 1). These two zones are about 8 km apart, separated by an *in-between area* characterised by pristine rocky cliffs, intermingled by small sandy beaches, and a high level of naturalness.

However, once a preliminary survey was carried out, it was decided that the *in-between area* should be included in the main survey in order to verify the conditions for proposing a unique multi-zoned marine protected area (MPA) stretching from Oum Toyour to Ras El Bassit



Figure 1 – The study area in the Northern part of Syria. Extract from “Rapport préliminaire - Première mission relative au développement d’aires marines protégées sur les côtes Syriennes »

MATERIALS AND METHODS

Fieldwork was carried out between 3-11 August 2003. Good weather conditions allowed for 9 consecutive working days. A tourist boat (Photo 1) was used for approximately 6-8 hours each day. Two representatives of Syrian army and two experts appointed by the Syrian Authorities attended the surveys.



Photo 1 – The boat used during the survey

Pre-survey

A one day pre-survey was carried out in order to:

- obtain a initial characterization of the whole area;
- design the sampling strategy;
- decide where to allocate sampling effort for a bathymetric characterization; and
- decide where to allocate sampling effort in order to identify local assemblages and species.

At the end of the pre-survey, it was decided that the whole area between Ras El Bassit and Oum Toyour should be included in the survey; sampling effort for the bathymetric characterization in the area should be homogeneously distributed; the effort for the biocoenoses and species identification should be concentrated on the potential Ras El Bassit and Oum Toyour MPA; and samples should be collected from the areas in between these two localities.

Subdivision of the area into units

The study area was divided into units according the criteria listed below:

- Administrative: protected vs. non protected areas; and
- Qualitative: presence vs. absence of consistent hard substrate in the infralittoral layer; and the nature of the substrate (calcareous vs non calcareous).

The following four sampling units were then identified (Figure 2):

1. Ras El Bassit, calcareous with rocks throughout the infralittoral;
2. The northern section of the *in between* area, non calcareous with rocks in most of the infralittoral;
3. The southern section of the *in between* area, non calcareous with no rocks in the infralittoral; and
4. Oum Toyour, protected by MPA status.



Figure 2 – The four units identified in the study area

General description of the study area

The surveyed area lays along the northern coast of Syria between Ras El Bassit in the north and Oum Toyour in the south. It stretches north-south for approximately eight miles. Ras El Bassit is a little flat calcareous cape facing west (Photo 2).



Photo 2 – Ras El Bassit

The cape slopes sharply down underwater with rocky bottoms as the main feature of the infralittoral area. Ras el Bassit is bordered, both north and south, by two sandy beaches. A third little beach is present in the centre of the cape. Its southern coast becomes abruptly vertical for one mile, and is characterized by rocky bottoms in most of the infralittoral area (Photo 3).



Photo 3 – The coast to the South of Ras el Bassit

Proceeding further southward, the coastal landscape remains characterized by high vertical cliffs of metamorphic rocks, intermingled with rocky and sandy beaches. The infralittoral is dominated by sandy and sandy-muddy bottoms. Rocky bottom generally ends close to the coast at approximately 3-5 m depth.

The landscape changes again just close to the village of Oum Toyour, where a little gulf starts. The gulf is entirely covered by fine sediment and includes the largest sandy beach of the area. The beach ends with two magnificent calcareous twin outcrops (Photo 4).

These are vertical cliffs ending directly on a sandy sea bottom at a depth of about five meters. The two cliffs encompass a little sandy beach (Photo 5).

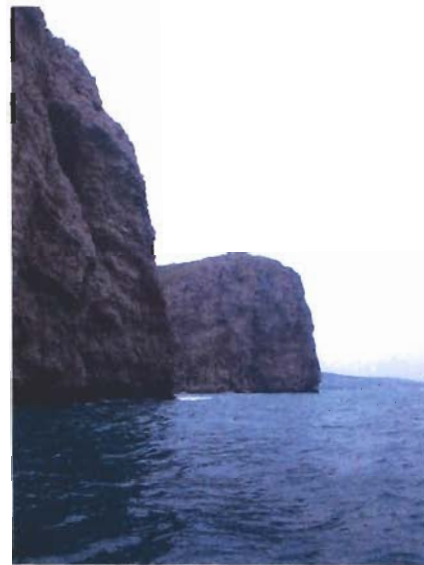


Photo 4 - The two calcareous cliffs of Oum Toyour



Photo 5 – The small beach between the two outcrops of Oum Toyour

Bathymetric characterization of the area

A manual echo sounder, provided by the Syrian army, was used to measure the bottom depth along 24 chosen transects. The transects were drawn at approximately equal distance from one another (roughly 500 m) and perpendicular to the coastline (Figure 3).

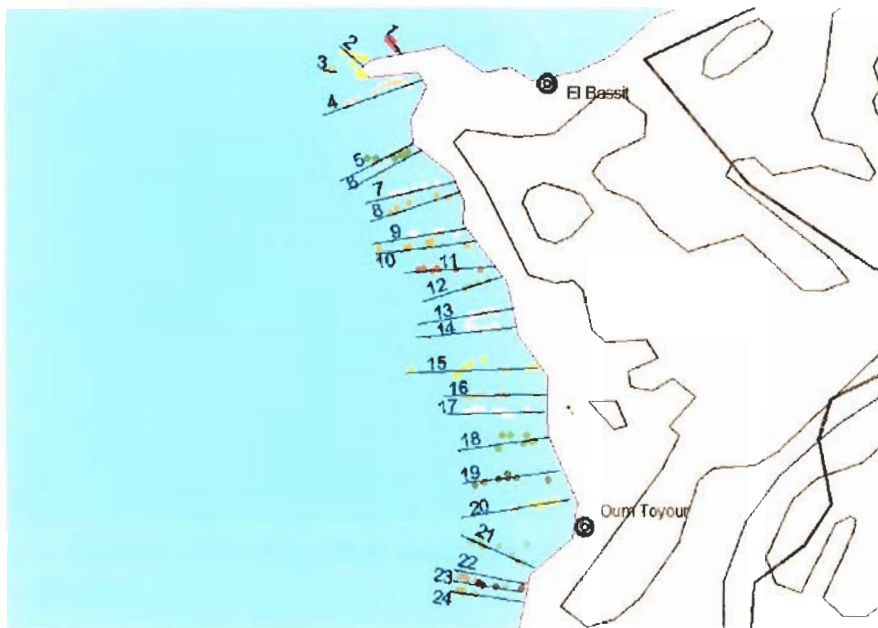


Figure 3 – Bathymetric survey: the 24 transects and the 170 points along the transects.

The position of each measured depth point was recorded using a hand-handled GPS. Each transect stretched from close to the coast at about 3-5 m depth to about 40 m depth. When possible the GPS position was recorded for the following depths: 3, 5, 10, 15, 20, 30 and 40 m.

Rough data concerning the 170 sampled points (depth, longitude and latitude), are shown as an annex to this report (Annex I). The SURFER Software will be used to calculate the DTM (Digital Terrain Model).

Identification of benthic assemblages

Assemblage identification was carried out by visual census along transects perpendicular to the coast line (Figure 4). A total of 24 transects were chosen, giving priority to Ras El Bassit and the Oum Toyour MPA. Overall, 11 transect were censused at Ras El Bassit, eight at the Oum Toyour MPA and five along the coastal area in between. A diver swam either by snorkelling or scuba diving along each of the 24 transects. The dive started at approximately 20 m depth and ended once the coastline was reached. Two of the 24 transects (No 23 and 24) were carried out in open sea in order to investigate some sea mountains off Ras El Bassit and the deep rocky bottom of the unit 2. The diver annotated on a plastic form the topography of each transect at depth and identified the main assemblages met, using Meisnez *et al.* (1983) and Pérès (1982) as a reference. Each transect was roughly 10 m wide.



Figure 4 – Identification of benthic assemblages: the 24 scuba diving transects and the spotty dives (●).

Some scattered spotty dives were also made in the whole study area to better characterize the sea bottom between each transect (Figure 4).

Pictures of the main assemblages were taken using a NIKONOS V equipped with a SB105 underwater electronic flash. Once a dive was finished, the operator explored the inter-tidal area corresponding to the transect and annotated both the topography and the assemblages encountered. In some cases, exploration of the intertidal portion of the transect was not possible due to the presence of excessive waves breaking on the coast.

Check list of benthic, nectobenthic and pelagic species

The sea bottom sketches drawn during identification of the benthic assemblages were used as a baseline for the species identification survey. A diver randomly crisscrossed along each transect collecting species data from the identified assemblages, reporting it on a plastic form. The diver identified fish species during a first trip and benthic species on a second trip. A rank of abundance was given to each of the encountered species as follows: 1 = present, 2 = common, 3 = abundant.

A midlittoral species characterization was possible only during very calm sea conditions.

RESULTS

Bathymetric characterization of the area

The rough data of the bathymetric survey are shown in the annex I.

A map showing the results of the depth points interpolation will be prepared superimposing our data onto a photo-satellite image provided by RAC/SPA, which will be used as a cartographic reference.

Identification of the benthic assemblages

Overall, 18 assemblages were identified, 2 from sopralittoral, 2 from midlittoral, 13 from the infralittoral and 1 from the circalittoral layer (Table 1). Each assemblage has been given an identification number.

For assemblages 1, 4 and 17 no taxa are reported because there were no visually identifiable species in those assemblages (Table 2).

Unit 1, regarding the area around Ras El Bassit, showed the highest number of assemblages, followed by Unit 4 at Oum Toyour, Unit 3 in the southern section of the *in between area*, and Unit 2 in the northern section of the *in between area*, respectively (Table 1). Six assemblages are common to the 4 Units (1, 2, 3, 4, 13 and 16); five are exclusive of Unit 1 (4, 6, 9, 10 and 14); four are exclusive of Unit 1 and 4 (7, 11, 12 and 17); two are exclusive of Units 1, 2 and 3 (8 and 15); and one is exclusive of Unit 1 and 2 (18) (Table 1).

Table 1 - List of the assemblages found the in the four Units, 1, 2, 3 and 4 in which the surveyed area has been divided.

N = Reference number following Meinesez et al., 1983.

N	ID	Assemblage	Zones	Present in Unit
1	1	Sandy substrates	Supralittoral	1-2-3-4
2	2	Hard substrates	Supralittoral	1-2-3-4
4-5	3	Hard substrates upper and lower subzones	Midlittoral	1-2-3-4
9-10	4	Soft substrates upper and lower subzones	Midlittoral	1-2-3-4
11	5	Platforms with <i>Dendropoma petraeum</i>	Infralittoral	1
13	6	Facies with <i>Titanoderma byssoides</i>	Infralittoral	1
43	7	Upper clean-sand	Infralittoral	1-4
45	8	Fine, well-sorted sand	Infralittoral	1-2-3
29	9	<i>Halophila stipulacea</i> beds	Infralittoral	1
25	10	<i>Zoostera noltii</i> beds	Infralittoral	1
46	11	Coarse sands and Fine Gravels under Bottom Currents	Infralittoral	1-4
12	12	Photophilic Soft Algae in the surf zone	Infralittoral	1-4
19	13	Photophilic Soft Algae with dominance of <i>Styopodium schimperi</i>	Infralittoral	1-2-3-4
23	14	Sciophilous with crustose calcareous rhodophytes	Infralittoral	1
22	15	Sciophilous without crustose calcareous rhodophytes	Infralittoral	1-2-3
20	16	Sea Urchin and Calcareous Algae (Barrens)	Infralittoral	1-2-3-4
	17	caves	Supra-Mid-Infralittoral	1-4
	18	Pre-coralligenous with sponges	Circalittoral	1-2

Check list of the identified benthic, nectobenthic and pelagic taxa

80 taxa were identified in Unit 1, 44 in Unit 4, 42 in Unit 2, and 26 in Unit 3. Fish were the most abundant taxa in all the units, followed by algae, molluscs, other invertebrates, sponges and reptiles, respectively (Table 3).

Table 3 – Number of taxa per each taxonomic group found in the four Units between Ras El Bassit and Oum Toyour.

	Unit 1	Unit 2	Unit 3	Unit 4
Taxon				
Algae	21	9	8	14
Sponges	4	4	1	3
Molluscs	11	5	3	5
Other invertebrates	14	8	5	7
Fish	28	16	8	15
Reptiles	2	0	1	0
Total number of taxa	80	42	26	44

The highest number of taxa was found in assemblage 13, corresponding to three of the units: Unit 1 (29 taxa), Unit 3 (14 taxa) and Unit 4 (24 taxa). In Unit 2, assemblage 16 was the richest (21 taxa). The lowest number of taxa was found in assemblage 2 for Unit 1 (3 taxa) and 4 (2 taxa), in assemblage 8 for Unit 3 (2 taxa), and in assemblage 8 and 1 for Unit 4 (1 taxa in each).

Overall, the species with the highest frequency of occurrence was the gastropod *Strombus persicus* (52%), followed by the ornate wrasse *Thalassoma pavo* (39%) and the brown invasive alga *Styopodium schimperi* (32%). 14 taxa reached frequency of occurrence values between 20 and 30 percent: 3 algae (*Chaetomorpha* sp., *Halopteris* sp. and *Padina pavonica*); 1 hydroid (*Macrorhynchia phylippina*); 2 molluscs (*Littorina punctata* and *Patella* spp.); 1 crustacean (*Chtamalus* sp.); 2 echinoderms (*Arbacia lixula* and *Paracentrotus lividus*); and 5 fish (*Chromis chromis*, *Diplodus sargus*, *Diplodus vulgaris*, *Epinephelus marginatus* and *Siganus rivulatus*).

Qualitative description of the benthic assemblages

A summary of the main assemblages found in each of the four units is shown in the sketches of the 24 transects used to characterize the benthic assemblages of the area (Annex 2). Here, in this section, a short description of the 18 identified benthic assemblages is given.

Supralittoral: Sandy substrates

This is an assemblage commonly found beyond most of the sandy and rocky beaches (Transects 10, 14, 21, Annex 2). Unfortunately, it was not possible to identify any species for this assemblage.

Supralittoral: Hard substrates

This assemblage is common throughout most of the surveyed area, with the exclusion of beaches (Transects 4, 5, 6, 9, 11, 13, 17, 20, 22, Annex 2). The most common species identified were: *Littorina punctata*, *Ligia italica* and *Chtamalus* sp.

Midlittoral: Hard substrates upper and lower subzones

This assemblage is common throughout most of the surveyed area, with the exclusion of sandy beaches (Transects 1, 4, 10, 13, 16, 17, 20, 22, Annex II).

The most common identified species were: *Chaetomorpha* spp., *Laurencia papillosa*, *Actinia aequina*, *Dendropoma petraeum*, *Littorina punctata*, *Monodonta* spp., *Patella* spp.

Midlittoral: Soft substrates upper and lower subzones

This assemblage is found specifically within the sandy beaches (Transect 2, Annex II). Unfortunately, it was not possible to identify any species for this assemblage.

Mid-Infralittoral: Platforms with *Dendropoma petraeum*

The midlittoral layer in this area of the Mediterranean is generally narrow, due to the low difference in height between low and high tide. In Ras El Bassit, however, it is uncharacteristically wide due to the presence of a calcareous platform of abrasion (terrace) which surrounds most of the cape (Transects 5, 6). Part of the platform is covered by the mollusc *Dendropoma petraeum*. Another wide strip of this assemblage was found close to Ras El Bassit, in the little beach located southward, just behind the cape (Transect 10). It is a rocky beach, characterized by *D. petraeum* formations. Formations consist of a belt surrounding one-third of the beach. The structures are atoll-shaped of different sizes with a dense cushion made of calcareous algae at the base, notably consisting of *Titanoderma byssoides*. A similar, though less structured, *D. petraeum* formation is found in another rocky beach located in Unit 2. Among the associated species there are: *Laurencia papillosa*, *Jania rubens*, *Pachigrapus marmoratus*.

Infralittoral: *Facies with *Titanoderma byssoides**

This assemblage is a facies of the Photophilic Soft Algae in the surf zone. This facies is found in the northernmost part of the surveyed area, the northern tip of the little gulf facing north of Ras El Bassit (Transect 1). It is characterized by an abundance of *Titanoderma byssoides*, at a depths between 2 and 0.5 m. Other associated algae with significant coverage were: *Amphiroe* sp., *Cystoseira* spp. and *Stypopodium schimperi*. Among the invertebrates, *Tonna galea* and *Cypraea (Erosaria) spurca* were present.

Infralittoral: Upper clean-sand

This assemblage is widely present off the Oum Toyour beach in shallow water (Transects 2, 7, 16, 20, 22, Annex II). The only identifiable species observed was *Strombus persicus*.

Infralittoral: Fine, well-soted sand

This assemblage is commonly found close to many beaches and is also widespread at depth ranging between 6 and 20-25 meters parallel to the coast in Units 2, 3 and 4 (Transects 1, 2, 3, 4, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, Annex II). The only identifiable species observed was *Strombus persicus*. Some phanerogames are also present, either scattered or dense enough to make a recognizable facies. These species include: *Halophila stipulacea* and *Zostera noltii*. In the water column above this assemblage, two species of turtle, *Caretta caretta* and *Chelonia mydas*, were observed either swimming on the surface or close to the sea bottom.

Infralittoral: *Halophila stipulacea* beds

This assemblage is found as a facies of the fine, well-soted sand assemblage on the shallow water (approx. 8 – 10 m) off the sandy beach located northern of Ras El Bassit (Transects 3, 4, Annex II).

Infralittoral: *Zoostera noltii* beds

This assemblage is basically found as a facies of the well-soted sand assemblage in shallow water (approx. 8 – 10 m) off the sandy beach located north of Ras El Bassit (Transects 3, 4, Annex II).

Infralittoral: Coarse sands and Fine Gravels under Bottom Currents

This is a deep, soft bottom assemblage, which is found in Units 1 and 4, at depths greater than 15 m (Transects 5, 6, 7, 8, 20, 22, Annex II). One of the distinguishable features is the large presence of the alga *Penicillus capitatus*. The presence of two species of the genus *Caulerpa* was also notable: *C. cfr racemosa* and *C. cfr scalpelliformis*. Among the invertebrates, there are several mollusc species: *Cardita clyculata*, *Glycymeris pilosa*, *Octopus vulgaris*, and, *Strombus decorus persicus*,

irregular echinoids and the polychaete *Hermodice carunculata* which are very abundant.

Infralittoral: Photophilic Soft Algae Assemblage in the surf zone

This assemblage is rare in the area and is basically confined to environments characterized by a strong hydrodynamic regime at an average depth ranging between 1 and 3 m (Transects 5, 6, 13, 18, Annex II). Algae are represented by a turf, covering most of the available substratum. Several sessile organisms were also present, including sponges, hydroids and the ascidian *Phallusia nigra*. Another notable feature was the presence of several juvenile individuals of different fish species.

Infralittoral: Photophilic Soft Algae Assemblage with dominance of *Styopodium schimperi*

This assemblage is found throughout the coastal zone of the study area in shallow water, generally from 1-2 up to 20-25 m depth (Transects 1, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 18, 23, Annex II). Generally, this assemblage has the highest species richness. It is dominated by the presence of the brown alga *Styopodium schimperi*, which covers most of the available substrate. Most of the species richness is represented by fish. The finding of a specimens of *Caretta caretta* laying on the sea floor of this assemblage during one of the dives is noteworthy.

Infralittoral: Sciophilous without crustose calcareous rhodophytes

This assemblage is found in all the units but Unit 3. Generally, it appears along the vertical walls of submerged outcrops rising out for few meters from shallow soft bottom. It represents an impoverished version of the photophilous assemblage. The most common and abundant species is the brown alga *Styopodium schimperi*. Other species includes sessile organisms like sponges, *Crambe crambe*, and hydroids, *Macrorhynchia phylippina*. Fish are well represented, mainly by labrids and sparids.

Infralittoral: Sciophilous with crustose calcareous rhodophytes

This assemblage is only found along the southern side of the vertical cliff, which boards Ras El Bassit (Transects 5, 9, 11, 13, 20, 22, Annex II). The assemblage is very similar to the Sciophilous without crustose calcareous rhodophytes assemblage; however, it includes several calcareous algal species such as *Corallina* spp. and *Pseudolithophyllum cabiochae*.

Infralittoral: Sea Urchin and Calcareous Algae (Barrens)

This assemblage is found throughout the coastal area of the study area in shallow water, from 0.5 up to 5-6 m depth (Transects 2, 3, 4, 6, 7, 10, 11, 13, 15, 18, 20, Annex II). It is characterized by medium-large densities of two sea-urchin species, *Arbacia lixula* and *Paracentrotus lividus*, and by a

small presence of erect macro algae species. The assemblage is rich in fish species.

Supra-Mid-Infralittoral: caves

This assemblage is found almost only in Unit 1 and 4. Unfortunately, it was not possible to identify any marine species for this assemblage. However, in Unit 4, above the cave located between the two calcareous twin outcrops a dense colony of bat was seen.

Circalittoral: Pre-coraligenous

This was the only assemblage censused in the circalittoral layer at between 20 and 35 m depth in Unit 1 (Transects 8, 11, 23, 24, Annex II). It is characterized by the presence of several sponge species, notably *Axinella* spp., *Ircinia* sp. and *Spongia* sp. Some algae species, such as *Zonaria flava* and *Caulerpa racemosa*, and the polychaete *Ermodice carunculata* are also abundant.

Sensitive species and habitats

Species

In total, six endangered or threatened species, as listed in Annex II, and two species listed in Annex III (species whose exploitation should be regulated) of the SPA Protocol were identified in the study area. A list of these sensitive species is given in table 4. Listed in table 4 are an additional three taxa (*Cystoseira* spp, *Axinella* sp., *Ircinia* sp), of which several species are included in Annex II and should not be excluded that the genus found belong to these species. The species *Ephinephelus costae* has been inserted in the table as a member of the grouper group as it is generally considered worthy of management protection.

Therefore, there are a total of 14 sensitive species present in the study area. All 14 species are present in Unit 1, which indicates that this area is in need of attention. Seven of these species were found in Unit 2, four in Unit 3 and six in Unit 4.

Of these sensitive species, the presence of the sea turtles *Caretta caretta* and *Chelonia mydas* should be underlined. Both of these species were found to be significantly abundant (up to 4 sightings per day) in the area surrounding Ras el Bassit (Unit 1).

The grouper *Ephinephelus marginatus* was found throughout the study area, but the frequency and highest densities were observed in the zone around Ras el Bassit (Unit 1) and in Unit 2. All of the individuals observed were juveniles (lengths between 6 and 20 cm).

Table 4 – Sensitive species mainly following the Annexes II and III of the SPA Protocol

Species	Annexes of the SPA Protocol		Units			
	II	III	1	2	3	4
ALGAE and PHANEROGAMES						
<i>Cystoseira spp.</i>	*		+			
<i>Zostera noltii</i>	*		+			
SPONGES						
<i>Axinella sp.</i>	*		+	+		
<i>Ircina sp</i>	*		+	+		+
<i>Spongia sp.</i>		*	+	+	+	+
MOLLUSCS						
<i>Dendropoma petreum</i>	*		+	+		+
<i>Erosaria spurga</i>	*		+			
<i>Pinna nobilis</i>	*		+			
<i>Tonna galea</i>	*		+			
ECHINODERMS						
<i>Paracentrotus lividus</i>		*	+	+	+	+
FISH						
<i>Ephinephelus costae</i>			+	+		+
<i>Ephinephelus marginatus</i>		*	+	+	+	+
REPTILES						
<i>Caretta caretta</i>	*		+		+	
<i>Chelonia mydas</i>	*		+			

Pinna nobilis was observed in a sheltered bay between Ras El Bassit and the village of El Bassit. The phanerogam *Zostera noltii* and *Halophila stipulacela* were also present inside of this bay.

The mollusc *Dendropoma petreum* was present between the midlittoral and infralittoral regions of Units 1, 2 and 3. In Unit 1, it originates a "trottoir" at the cape, while in the bay waters on the south side of the cape, *D. petreum* forms atolls on a beach rock.

The genus *Cystoseira* was also observed in this same bay on the south side of cape El Bassit, but the thallus of the algae were minimal, probably because the census was conducted at the end of the vegetative season. This did not allow for species specific identification nor an understanding of the population density of this taxa.

The genus *Axinella* is present with a relatively high density in Units 1 and 2 on rocky bottoms under 20 m depth.

Habitats

Of the 18 assemblages present in the study area, some can be considered to be more worthy of attention than others because they are particularly sensitive or important for the reproduction of protected species.

Emersed beaches used as nesting sites for marine turtles. All beaches within the study site were visited¹, five of these had the characteristics (ease of access, absence of submersed reefs, fine sand, and ample length) that could make them usable for turtle reproduction. Two of these beaches are found in Unit 3, and three in Unit 4, two to the north of the town and one between the two outcroppings that delimit the borders of the MPA. In this last beach, turtle tracks were observed. The fishermen of the small port of El Bassit confirmed that from May to July nesting turtles are frequently observed on these beaches.

Platforms with *Dendropoma petraeum*. The "trottoir" was observed along the Ras El Bassit Reef (Unit 1). The platform is fragmented and of small size.

Facies with *Titanoderma bissoides*. This calcareous algae was observed at low densities in a variety of zones within the study area, but true facies are present only in the area north of Ras El Bassit. In this zone, *Titanoderma bissoides* has created particularly organogenic structures which are associated with other calcareous algae and a rich fauna. In this assemblage the molluscs *Tonna Galea* and *Erosaria spurga* were observed.

Beach rock with *Dendropoma* reef and calcareous algae (*Titanoderma bissoides*). Organogenic formations of *T. bissoides* in the form of "mushroom", with variable diameters from 10 to 100 cm, were present in the midlittoral and infralittoral zones from above the bay to the south of Ras el Bassit (Unit 1). This area consists primarily of *Dendropoma petraeum*, which forms atolls and *Titanoderma bissoides* in the form of "mushroom". In particular, the fragility of these organogenic formations suggests that this assemblage should be considered among the sensitive habitats of the area.

Facies with *Zostera noltii* and *Halophila stipulacela*. The phanerogam *Z. noltii* was observed in a sheltered bay between the cape of Ras El Bassit and the village of El Bassit. *Z. nolti* was present in modest densities and often alternated with another phanerogam from Red Sea, *Halophila stipulacea*.

¹ Beach exploration of the study area was made possible through the collaboration with Daniel Cebrian, Export Marine Biologist of RAC/SPA.



Photo 6 – The cave on the cliff of Oum Toyour inhabited by a colony of bats

Finally, certain attention should be given to the grottos present in the south of Ras El Bassit and in the two calcareous outcroppings of Oum Toyur due to the sensitivity and delicateness that normally characterizes this type of environment. The presence of a bat colony with at least 100 individuals in one cave in the Oum Toyour outcroppings (Photo 6) is worth further investigation.

Identified potential problems - qualitative observations

Waste disposal was observed to the north of Ras El Bassit, behind the beach located on the south of the cape. The disposal consisted of many plastic bags, which are constantly being moved by the wind to the beach and then into the sea. The sea floor of the little gulf off the beach was covered by plastic bags. In general, plastic bags were a common finding in the entire area. It is well known how these bags could be dangerous to local organisms, in particular for turtles.

Similarly, ghost nets were quite often found in the studied area. A specimen of *Chelonia mydas* was found dead in a net during the observation period.

Near the tourist beach of El Bassit, jet skis are becoming a trendy water sport. This also could have a detrimental impact on turtles by crashing into individuals laying on the sea surface.

Still on the tourism side, the boats used for tourist transport in the area are characterized by an iron stair on the front, used to make the passage into the boat easy. When approaching the rocky beaches this stair was observed to negatively impact *Dendropoma petraeum* and *Titanoderma byssoides* formations.

Also on the El Bassit beach, several untreated sewage outputs are present, negatively affecting the water quality of the area.

Spearfishing of juvenile groupers seems to occur frequently in the area to supply restaurants with fresh fish.

FINAL CONSIDERATIONS

Even if, due to logistical constraints, most of this investigation was carried out using traditional methods², the survey, thanks to the good weather condition and the collaboration of Syrian Army and Syrian experts, this study was able to collect a number useful data regarding the physical and biological characteristics of the entire zone between Oum Toyour and Ras El Bassit. In total, 89 taxa (14 of which are considered sensitive species) and 18 habitat assemblages were identified.

This project, among other things, has shown that traditional methodologies used for benthic biocoenoses classifications (Pérès, 1982; Meisnez *et al* 1983) are not always able to represent the characteristics and peculiarities of assemblages in the Eastern Basin.

A series of points, on the following topics, which could constitute the idea for further studies and investigations have been identified: (i) the peculiar bioformations of the algae *Titanoderma bissoides*; (ii) the systematic of *Caulerpa* genus, with reference of the particular morphology of some specimen of *Caulerpa* observed to at more than 40 m depth; (iii) a pre-coraligenous characterized by sponges and *Caulerpa racemosa*; (iv) the extraordinary abundance of grouper juveniles (*Ephinephelus marginatus*) and the absence of sub-adult and adult individuals of this species; (v) the abundant presence of the sea turtle species *Caretta caretta* and *Chelonia mydas*; and the wide spread of some exotic species like the mollusc *Strombus persicus* and the algae *Styopodium shimperi*.

Based on the information, observations and data collected in the present study and the results reported in this report, the following scheduled other outputs will be realized:

- "The detailed recommendations for the management of the area" and
- a GIS, which, other than providing a map of the physical and biological characteristics of the study area, will contain a wide variety of information and data useful for the management of the area.

² These included: the use of a tourist boats; mapping interpolating single transects collected by divers without the use of side scan sonar; made a bathymetric survey by manual instruments rather than using continuous recording systems.

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