



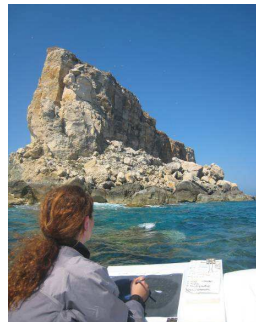
NOTE NATURALISTE

Mission PIM May 2008 - Report April 2011

With the support of :



Ecological status of the rocky coast of Malta



Mission/report realized in partnership with :



L-AWTORITÀ TA' MALTA DWAR
L-AMBIJENT U L-IPPJANAR



Thierry THIBAUT - University of Nice Sophia Antipolis

Dans le cadre de la coopération initiée en 2008 entre le Conservatoire du littoral et le MEPA, une mission de terrain s'est déroulée sur Malte et ses îles en Mai 2008. Au cours de cette mission, une expertise marine a été menée afin d'évaluer l'état écologique du littoral rocheux maltais, en s'appuyant sur la méthode CARLIT, développée afin de calculer des indices de qualité écologique à partir de la cartographie de l'abondance des espèces végétales de l'étage médiolittoral et de l'horizon haut de l'étage infralittoral supérieur notamment des populations de *Cystoseira*, de la nature du substrat et de la géomorphologie de la côte.

Cette mission aura également été l'occasion de former le personnel du MEPA à cette méthode, appliquée pour la première fois dans le bassin oriental de la Méditerranée.

Mots-clés : Malte, expertise marine, méthode Carlit, qualité écologique, littoral, espèces végétales, cartographie

ABSTRACT

In the framework of the cooperation initiated in 2008 between le Conservatoire du littoral and the MEPA, a field trip has been organised on Malta and its islands on May. During this mission, a marine expertise has been lead to evaluate the ecological status of the maltese rocky coasts, using Carlit method, which has been developed to calculate indices for environmental quality on the basis of a mapping of the abundance of plant species in the mediolittoral stage and the high horizon of the upper infralittoral stage including the populations of *Cystoseira*, the type of the substrate and the coastal geomorphology.

This mission has also be the occasion to train the MEPA to this method, applied for the first time in the eastern part of the Mediterranean basin.

Key-words : Malta, marine expertise, Carlit method, ecological quality, coast, vegetal species, mapping

DATAS ABOUT THE MISSION

Place : Malte

Dates : 12 au 17 Mai 2008

List of the participants :

Sami Ben Haj (coordinator) ; Sébastien Renou (coordinator) ; Pierre Bougeant (head of the delegation) ; Céline Damery (project officer PIM database ; public welcoming) ; Daniel Pavon (botanist) ; Olivier Peyre (herpetologist) ; Michel Pascal (mammalogist, expert on invasive species) ; Vincent Bretagnole (ornithologist) ; Audrey Sternalsky (ornithologist) ;Thierry Thibault (marine biologist) ; Pierre-Alain Mannoni (marine biologist) ; Stéphane Renard (site manager) ; Adbelkader Lalaoui (site manager) ; Jean-Paul Lassort (dessinateur naturaliste) ; Louis-Marie Préau (photographer)



CONTEXT

PIM Initiative, for the Mediterranean Small Islands

Since 2006, the Conservatoire du littoral coordinate an international program of promotion and assistance to the management of micro-insular territories of the Mediterranean, called « Initiative PIM pour les Petites Iles de Méditerranée » as Initiative for Mediterranean Small Islands, supported by the French GEF (FFEM), the Water Agency of Rhône-Méditerranée-Corse and the City of Marseille.

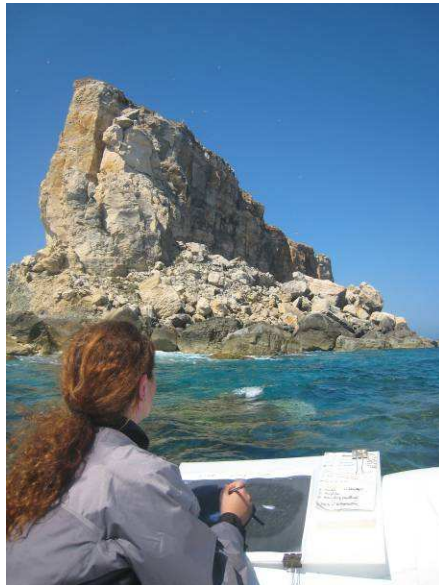
The PIM Initiative aims to exchange and share knowledge for the emergence of good management practices on these exceptional spaces. During field missions and training, wardens, technicians, scientists, naturalists, managers, administrations and NGOs can meet each other and work together to promote the protection of small islands in the Mediterranean and to implement concrete management actions, having a positive impact on ecosystems, biodiversity, natural resources and uses.

Partnership :

This mission has been organized in the framework of the cooperation initiated in 2008 between the Conservatoire du littoral and the MEPA (Malta Environment and Planning Authority), with the support of the Embassy of France in Malta.

REPORT OF THE MISSION

In the Mediterranean, almost 50% of total species are living in the area between the surface and 10 meters deep. Most of them live very close to the surface. In rocky areas, algal communities provide habitats for this biodiversity, including large populations of brown algae of the genus *Cystoseira* (Fucales). These species characterizing pure waters, including the 5 protected ones at European level, are considered as good indicators of coastal environmental quality. A Catalan method called CARLIT has been developed to calculate indices for environmental quality on the basis of a mapping of the abundance of plant species in the mediolittoral stage and the high horizon of the upper infralittoral stage including the populations of *Cystoseira*, the type of the substrate and the coastal geomorphology. This method is applied in the context of the Water Framework Directive in France, Italy and Spain. The objective of the mission in Malta was to train MEPA staff (Malta Environment & Planning Authority) on the method. During this joint mission, undertaken in May 2008 and involving our team (Thibaut T. et Mannoni P.-A.) and a Maltese team led by Carmen Mifsud, the CARLIT method has been applied for the first time in the eastern basin of the Mediterranean.



Using a zodiac for 3 days, we have mapped 80% of the total coastline of the Maltese Islands. The remaining 20% have been completed few weeks later by Carmen Mifsud team (Fig. 1).

Photo 1. Mapping from a zodiac, of plant species in the mediolittoral and the high horizon of the upper infralittoral stages. . Malta in May 2008

Malta coastline has been divided into nine water bodies: seven of them have a very good ecological status (Ecological Quality Ratio > 0.75), the water body 5 has a good ecological status (MOR = 0.74) and the water body 9 has an average ecological status (MOR = 0.59).

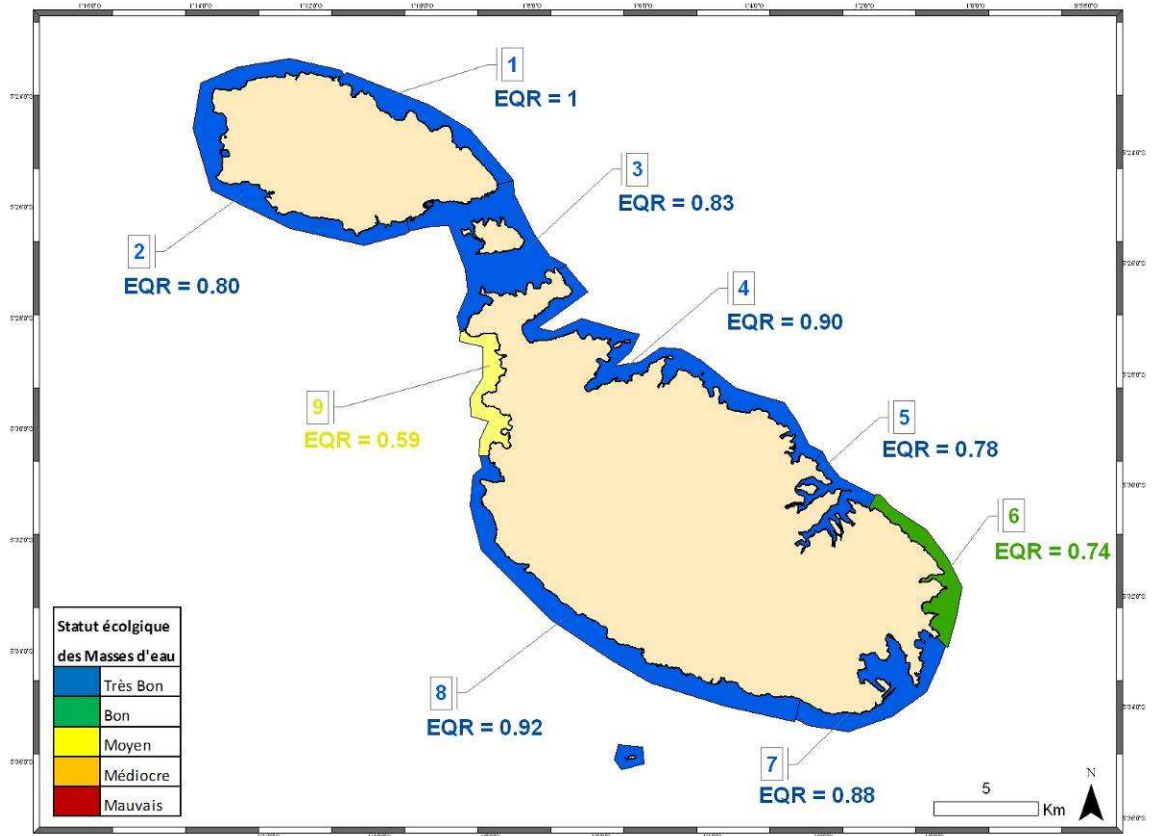


Figure 1 : Ecological status of water bodies across the rocky coast of Malta in May 2008



In the latter water body (Figure 1), it seems that the richest coastal part, in term of population, is the eastern side of the island. Indeed, there is a gentle slope from the coast (photo 2) which leads to the development of wide belts of the species *C. amentacea* var. *stricta* (photo 3) which form a rich community of over 150 species.

Photos 2-3. Gently sloping substrate favorable to the development of long and wide belts *Cystoseira amentacea* var. *stricta* (right) in the eastern coast of Malta.

Like trees, these algae structure the habitat into 3 dimensions, allowing associated flora and fauna to grow under their canopy. They are replaced by a calcareous red alga, *Corallina elongata*, a species indicative of poor water quality when any disturbance occurs. *Cystoseira amentacea* var. *stricta* is present all around the rocky coastline of the Maltese islands, except on Filfla, with a variable density ranging from individual presence to beautiful dense and continuous belts (Figure 2). This species colonizes 57% of the rocky coast of Malta (more than 112 km over the 195 km mapped coastline). *Cystoseira amentacea* var. *stricta* covers nearly 50% of the mapped coastline within each water body, except for the water body 9 where it represents only about 30% of species colonizing the coastline. *Cystoseira amentacea* var. *stricta* is abundant and its populations are dense (22% of populations are fragmented) which denotes a good quality of the whole Maltese rocky shoreline.

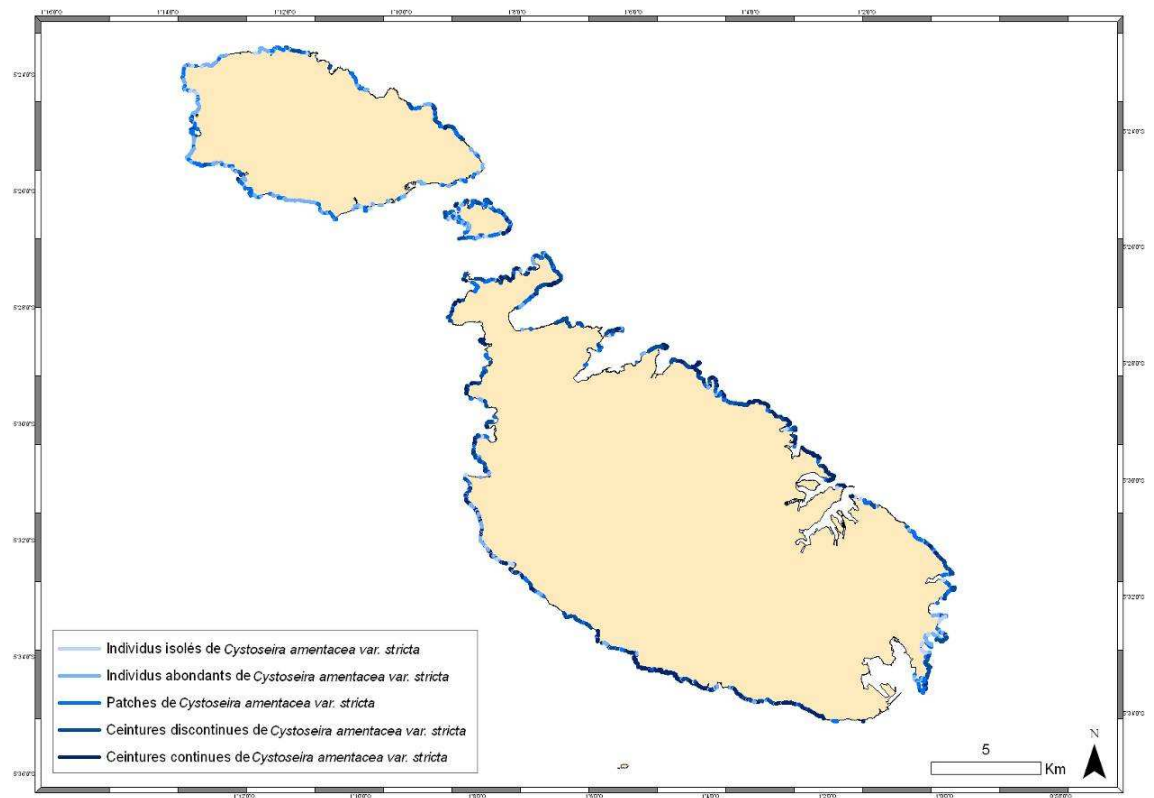


Figure 2 : Distribution of *Cystoseira amentacea* var. *stricta* along Malta coastline in 2008.

The western coast consists mainly of high cliffs (Photo 4.5). Furthermore, we have discovered and mapped, for the first time, large rims of *Lithophyllum byssoides* (photo 6). In caves or under rock overhangs, *Corallina elongata* grows primarily (photo 7).



Photos 4-7. Photo 4 top left: Cliffs and caves of the southern coast. 5. Top and right: High cliffs opposite Filfla. 6 bottom left: *Lithophyllum byssoides* rim. 7 bottom right: *Corallina elongata* developing at the bottom of the rocky overhang.

Lithophyllum byssoides is a red algae limestone, also protected (Appendix II of the Barcelona Convention, Annex I of the Bern Convention), and forms spectacular concretions of several tens of meters long and wide enough in some places for walk, resulting in calling them platforms.

These old formations with a very slow growth, of few millimeters per year, are filled with cavities housing several species. All around the rocky coastline, 41 *Lithophyllum byssoides* platforms were observed (Figure 3), exclusively at the southwestern side of the island. Forty (40) are located in the water body number 8, which corresponds to 845 m long and one was observed in the water body number 9, close to the limit of both water bodies 8 and 9. Their presence in this part of the island is attributed to the presence of large natural rock cliffs, favorable to the development of these formations.

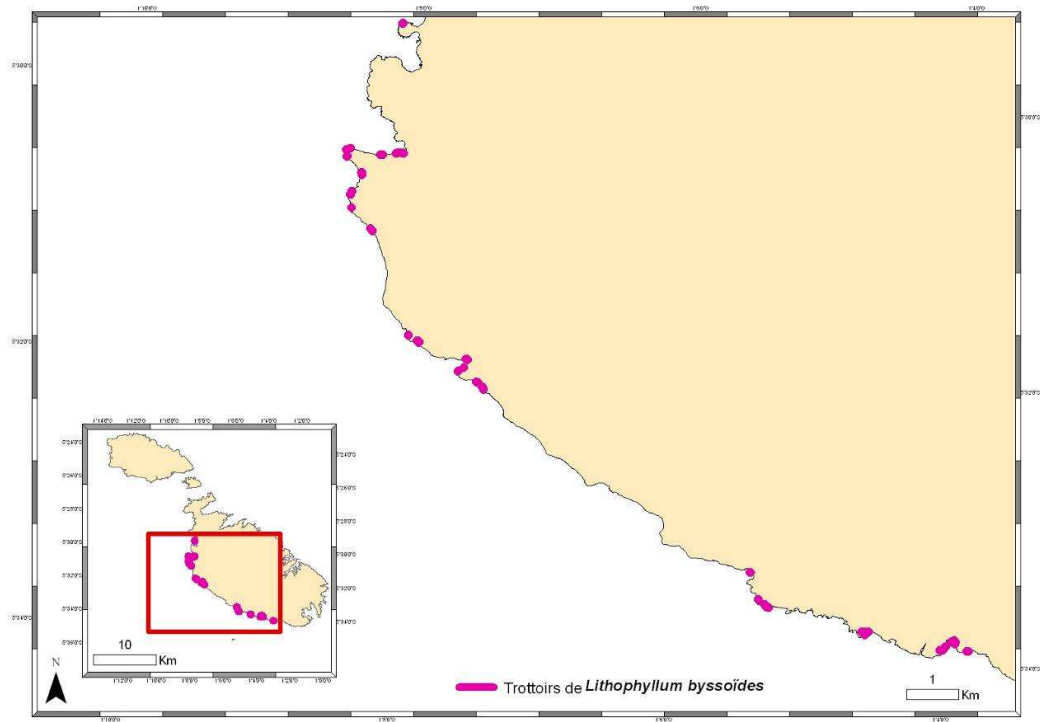


Figure 3 : Distribution of *Lithophyllum byssoïdes* rims along the Maltese coastline in 2008.

Damaged areas of the Maltese islands are located near the aquaculture cages of St. Paul's Bay (photo 8), right to the Comino pig farm, near the ferry docks at Blue Lagoon on Comino and of course at the entrance to Grand Harbor. The rocks are covered with *Corallina elongata* and *Ulva* (green algae growing in the presence of nitrate and phosphate pollution).



Photo 8. Aquaculture cages at St. Paul's Bay

Filfla case: we were the only team of the 2008 PIM mission to be able to dock on the islet. Surprisingly, this remote rock doesn't house any surface *Cystoseira amentacea* population but only *Cystoseira crinita* more in depth, despite very favorable conditions for its development. Several hypotheses may be advanced either the species has never arrived which is unlikely, or it has disappeared due to intensive shelling the islet has suffered for decades, and to the presence of copper, a powerful algaecide content in ammunition.

In general, the coastal environment is well preserved but it remains very vulnerable and poorly protected.