LIFE BaĦAR for N2K (LIFE12 NAT/MT/000845)

ACTION A2: Data Analysis and Interpretation

Report on the second analysis following the first surveying phase carried out through Action A3

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The Life+ Benthic Habitat Research for Marine Natura 2000 Site Designation (LIFE BaĦAR for N2K) project is an EU Life+ research programme that aims to conduct research on benthic habitats in Maltese waters to support designation of marine Natura 2000 sites. The project aims to collate existing information on marine benthic habitats in Maltese waters, carry out scientific surveys in areas where knowledge gaps are identified, and analyse the data collected during these surveys in order to map the distribution of three habitat types listed in Annex I of the Habitats Directive: sandbanks, reefs and marine caves. Action A2 is led by the Department of Biology (DoB) of the University of Malta (UoM), and is aimed at analysing and interpreting data generated during the LIFE BaĦAR for N2K project. The present report is concerned with the analysis of findings following the first marine habitat surveys carried out through Action A3 in the summer of 2015, and as such constitutes the deliverable of the second Action A2 analysis: "Report containing analysis of 1st phase of A3 surveys including recommendations".

The first Action A3 surveys were undertaken between 01 June 2015 and 23 July 2015. The surveys targeted the inshore and offshore areas identified as being of primary importance through the first Action A2 analysis. A total of 94 dives were carried out with a Remotely Operated Vehicle (ROV), mostly at offshore locations, while 12 SCUBA dives were made in inshore areas. Surveys undertaken in offshore areas were primarily aimed at identifying the location of reefs, while inshore surveys also focused on sandbanks and caves. In summary, analysis of the data collected during the first Action A3 surveys resulted in the following main findings with regards to the three habitats of interest for the LIFE BaĦAR for N2K project:

Reefs
- Identification of new areas with extensive and diverse cold water coral assemblages at depths of 300–1000 m extending some 20 km along the Malta Graben, including black coral forests at 200–400 m and predominantly white corals in waters deeper than 500 m, with some areas at depths of 800–1000 m dominated by alcyonaceans, together with other less abundant habitat-forming and associated species (especially sponges, cnidarians, echinoderms, molluscs, crustaceans and fish).
- Discovery of a dead (possibly fossil) lithistid sponge reef located northwest of Gozo at a depth of ca. 300 m, and extending over a 7 km wide area, serving as a substratum for several species including sponges, cnidarians and bryozoans.
- Identification of areas with dead coral frameworks and one site with a boulder field at 100 m depth supporting benthic faunal assemblages comprising a range of sponges, cnidarians, echinoderms, molluscs and crustaceans which, however, were less species rich than the assemblages recorded from areas with either living cold water corals or the lithistid reef.
- Characterisation of the infralittoral algae assemblages and associated fauna found on the submarine part of emergent vertical rock faces.

Sandbanks
- Absence of sandbanks at the surveyed locations, although several of the areas that could potentially host such habitats were not surveyed due to time limitations.

Caves
- Localisation of 15 emergent and 21 fully submerged caves in inshore areas, which varied in both size and physiognomy from small caves measuring only a few metres, to large fissures

and extensive tunnel systems penetrating deeply into the rock, and were characterised by a marked zonation in the associated biotic assemblages from the cave entrance to the inward parts of the cave.

- New records of deep-water caves, mostly located west and north of Gozo at depths of 205–450 m, but also including a cave recorded at the edge of the Malta Graben at 795 m.

In the case of reefs, the main threats and pressures appear to be due to the presence of marine litter. In particular, discarded fishing gear (limestone slabs and ropes) resulting from dolphinfish (*Coryphaena hippurus*) fishing activities using fish aggregating devices was very common in offshore sites, while litter mainly derived from land-based sources was observed closer to the coast. The extent of impacts of litter on the reef organisms could not be assessed although the reefs generally appeared to be in good status. The main source of threats and pressures on typical species found in emergent and submerged caves in the Maltese Islands is from SCUBA diving, but no impacts due to SCUBA diving were recorded in the surveyed caves, probably because the majority were small, inaccessible or unknown, and thus not frequented by divers. No assessment of sandbank habitats could be undertaken since there is virtually no information on the distribution of sandbanks (from a geomorphological point of view) around the Maltese Islands and no such habitats were identified during the first Action A3 surveys. The Action A3 surveys thus provided useful data that can serve as a baseline against which to compare the outcomes of any future surveys.

The 2015 Action A3 survey has provided information to fill some of the data gaps that were originally identified through the first Action A2 analysis, but some gaps in knowledge that need to be addressed through the forthcoming (2016) Action A3 survey remain, in particular:

- The lack of detailed bathymetric data, especially for offshore and deep areas, is still a major data gap for reef habitats. In addition, since it was not possible to survey all recommended priority areas during the first Action A3 surveys, more information on the distribution of reef habitats in Maltese waters should be collected to obtain a more complete picture of the distribution of reefs and on spatial variation in the faunal assemblages they support.
- Data deficiency remains a major gap with respect to sandbank habitats, since there is virtually no geomorphological information on the presence and distribution of sandbanks around the Maltese Islands. During the second Action A3 survey, the focus should be on acquiring and mapping detailed bathymetric data in shallow water areas using the *'Oceana Ranger'* vessel sonar where this is not yet available, coupled with broad-brush surveys of benthic assemblages in areas identified as potentially having sandbanks.
- In the case of caves, since it was not possible to survey all recommended priority inshore areas during the first Action A3 surveys, more information on the distribution of submerged and/or emergent marine caves around the Maltese Islands should be collected, while detailed biological characterisation of representative examples of emergent and submerged marine caves in different areas should also be undertaken.

Based on the analysis and interpretation of the data collected during the first Action A3 survey carried out in 2015, recommendations for areas to be surveyed during the second Action A3 survey were drawn up. Three sets of recommendations are presented in this report: (i) Recommendations for inshore surveys; (ii) Recommendations for offshore bathymetric surveys; (iii) Recommendations for offshore ROV surveys. Survey site selection took into account the likelihood of occurrence of at least one of the three habitat types of interest and priority was given to: (i) areas for which minimal

data exist, and (ii) areas which fell outside the boundaries of existing marine protected areas (MPA). It is recommended that the 2016 surveys should begin by addressing remaining data gaps in inshore areas. During this time the bathymetric surveys can be carried out. Once the results of the bathymetric surveys are available, the offshore ROV surveys can then target the most relevant areas of interest identified within the priority areas.