

# EVALUATION OF MARINE VERTEBRATE BIODIVERSITY OF NORTH CYPRUS COASTAL ZONE ACCORDING TO NATURA 2000 HABITAT TYPES

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## Abstract

In this study, species belong to marine vertebrate biodiversity of Akdeniz, Alagadi, Tatlisu, North Karpaz and South Karpaz Special Environment Protected Areas (SEPA) are listed according to "Natura 2000 Network" habitat types with applying underwater visual census (UVC) method. When compared with previous studies done at the area, it is determined that although covering many of the species, Natura 2000 marine habitat types need to be reevaluated to cover other habitat types and biodiversity in the Mediterranean.

**Keywords:** *Biodiversity, Coastal Waters, Conservation, Eastern Mediterranean, Fishes*

## Introduction

Over the last 25 years, European Union built up a vast network of over 26,000 protected areas covering all the Member States and a total area of around 850.000 km<sup>2</sup>, representing more than 20% of total EU territory. It is known as the Natura 2000 network - the largest coherent network of protected areas in the world. The legal basis for the Natura 2000 network comes from the Birds Directive which dates back to 1979 and the Habitats Directive from 1991. Together these Directives constitute the backbone of the EU's internal policy on biodiversity protection [1]. This study is done under EU project "Technical assistance for management and protection of potential Natura 2000 sites in the northern part of Cyprus (Ref No. EuropeAid/125695/C/SER/CY/7)" which is funded by the European Union under the Aid Regulation for the economic development of the Turkish Cypriot community (Council Regulation (EC) No 389/2006) in order to determine marine habitat types and biodiversity in relevant sites located at the coastal zone.

## Materials and Methods

This study has been conducted in the marine area of Akdeniz, Alagadi, Tatlisu, North Karpaz and South Karpaz SEPA's of North Cyprus. Cyprus Island is located in the northeastern part of the Mediterranean at 32-34 meridian and 34-35 north latitudes. The island is the only land in the Levantine Basin, which is also the third biggest island in the Mediterranean after Sicily and Sardinia. In order to identify the quantity and the quality of the species, underwater visual census (UVC) method has been utilized for this study. UVC, in simple terms, means that the diver collects quality and quantity based data using equipment, which would assist the researcher to breathe. Using the same method, there have been researches conducted at different locations and different habitats [2, 3, 4, 5]. Transects with different habitat (biotope) structures have been identified at every station. The length of these transects were limited with habitat boundaries. The dives on the transects were conducted to and back directions. On the "going" direction, fast swimming vertebrates were recorded through visual documentation. On the same direction, pelagic, benthic and forms in between the two have been counted. On the "back" direction, especially cryptic and small individuals were recorded. On this direction, sampling work has been conducted as well. During the dive, the researcher carried water-proof PVC notebook and a guide book for identification of the species - especially the ones, which can swim fast. After the dive, the notes taken at the PVC notebook would be transferred to the "area registration form". As much as the technical and environmental conditions permit, the species were recorded visually. Canon S-80 digital camera was used for recording the underwater visuals. In April - May 2009, UVC diving were conducted for 23 transects. During the field works species were recorded according to Natura 2000 habitat types as: "1110 Sandbanks which are slightly covered by sea water all the time", "1120 Posidonia beds", "1140 Mudflats and sandflats not covered by seawater at low tide", "1150 Coastal lagoons", "1160 Large shallow inlets and bays", "1170 Reefs" and "8330 Submerged or partially submerged sea caves". In order to better evaluate the habitat diversity cluster analysis was conducted. The cluster analysis for this research was conducted using the PAST package program. Bray-Curtis similarity analysis was used to identify the similarity levels and the results were drawn using the "Bray-Curtis Dendrogram" [6].

## Results

A total of 50 vertebrate species were recorded during the field works. Types 1120 (n:30), 1160 (n:28) and 1170 (n:39) are found to be biodiversity-rich habitats which cover rocky and/or macrophyte dominated substratum related species. Habitat type 8330 (n:6) includes similar but less number of species in comparison with rocky and/or macrophyte dominated substratum habitat

types because of the extreme conditions. Habitat types 1110 (n:8), 1140 (n:2) and 1150 (n:10) covers mainly soft substratum related benthic species except transitory visitors. According to species abundance, cluster analysis showed that habitat type 1140 is dissimilar with all other types. It is observed that, habitat type 1110 which covers bare substratum with sandy bottom is dissimilar with the group of habitats covering high relief rocky and/or macrophyte covered substratum types like 1120, 1170 and 1160 where 1150 and 8330 placed between these two main substratum types. Bray-Curtis Dendrogram given in Figure 1.

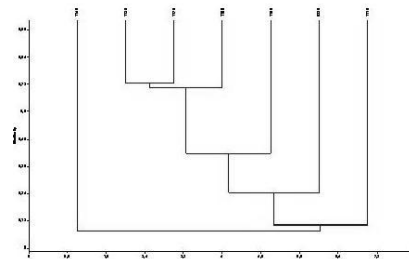


Fig. 1. Bray-Curtis Dendrogram.

## Conclusion

In this study, vertebrate biodiversity of 7 different Natura 2000 marine habitat types under protection are determined, however in a previous study which was done at similar locations, 83 vertebrate species at 37 different habitat types had been reported [7]. In addition, it is observed that, some habitat definitions appear to be too general, which create difficulties to distinguish and to determine boundaries and organize them in a classification system. It is suggested that, marine habitat classification system of Natura 2000 Network needs to be re-evaluated and the context should be extended in order to cover more habitat types and biodiversity in the Mediterranean.

## References

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