

INFORMATION TECHNOLOGY FOR ENDANGERED MARINE SPECIES MANAGEMENT: AFBİKA GEO-DATABASE

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Abstract

This study presents the Mediterranean Monk Seal Information and Rescue Network (AFBIKA geo-database), which has been designed and constructed to improve the monitoring of the critically endangered Mediterranean monk seal, *Monachus monachus* (Hermann, 1779) in Turkey. Sighting data gathered by SAD-AFAG through various projects and expeditions are entered to the system using Geographic Information System (GIS) and a linked database in order to gather information about distribution and habitat use of the species. With proceeding modifications to the network in the following years, it will probably serve as an effective management tool that may contribute to continuation of species survival.

Keywords : *Conservation, Eastern Mediterranean, Gis.*

Introduction

Effective formulation and implementation of any strategies, policies and plans are highly dependent on accurate, comprehensive and timely information [1]. Thus, management of the endangered marine wildlife needs to make use of Information Technology (IT) more frequently to achieve broader conservation goals. GIS, together with Database Management Systems (DBMS), may increase the capability of specialists concerned with endangered species issues. The aim of this study is to present the AFBİKA geo-database, which was built to enhance already established monk seal sighting database Fok-Data by SAD-AFAG in 1990 [2] which will serve better for the conservation of critically endangered *M. monachus* -with a population of around 100 individuals [3]- in Turkey.

Methodology

The field study was performed in 2005 and 2006 on the Aegean and Mediterranean coastal cities and villages of Turkey in order to invite the local stakeholders, who are likely to interact with the species, to AFBİKA membership. In this 72-day field study, 78 settlements were visited, and seal sightings were collected. AFBİKA geo-database was constructed on three components: database (MS Access), internet site and GIS (Manifold 6.5). The database includes each sighting record and member information whereas GIS includes additional tabular and geographical elements in different layers. Landsat satellite images were used as the background of the GIS environment and a grid system was created to map *M. monachus* sightings since it is often not possible to gather coordinates from observers. Turkish coasts were divided into three differently scaled grid cells: site (15" x 15"), parcel (1' x 1') and region (1' x 1') grids. Thus, the mappability of the records was increased and analysis in different scales was made possible if required. Seal sighting and member counts per grids were also calculated and entered into grid tables in order to create presence/absence maps by querying and thematic mapping (Figure 1).

Results

The reactions of the coastal stakeholders were generally affirmative; the number of AFBİKA members has reached to 186 and 83 seal sightings were recorded from these members. As well as sighting data, the locations of the members were also mapped to manage the expected and unexpected areas of data flow in the future. It was observed that although the number of individuals is few, *M. monachus* uses a wide geography in the Aegean Sea, Mediterranean Sea and the Sea of Marmara.

The Way Ahead: Next generation of AFBİKA

It is planned to improve the capabilities of AFBİKA geo-database in both species specific and managerial issues in the following years. The evolution includes addition of new components to the network as well as enhancing the existing GIS, database and web components. With sufficient budget and human capacity, following built-ups are designed to obtain an effective management tool for the conservation of the species:

User-friendly interfaces; for the data providers (AFBIKA members) via internet, and for data input to the system in order to minimize user errors.

Ready-to-use queries; for the specialists and managers for the species specific issues, and for habitat, ecosystem and human activities

management.Sub-programs; for enhancing the integration of existing database and GIS and for adding new capabilities such as link with a statistical software.

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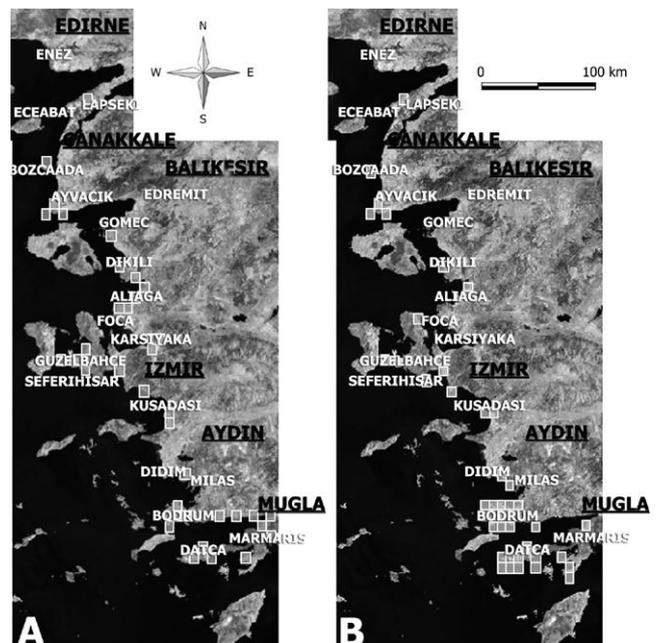


Fig. 1. The presence/absence maps of the locality of AFBİKA members (A) and *M. monachus* (B) for the Turkish Aegean coasts in 2006.

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