PRELIMINARY ESTIMATION OF THE POPULATION SIZE OF CUVIER'S BEAKED WHALE (*ZIPHIUS CAVIROSTRIS*) IN THE NORTHERN LIGURIAN SEA

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Abstract

This work aimed to estimate the size of the cuvier's beaked whale population using data collected during 7 years of cetacean survey, carried out in the Ligurian sea. The data collected from 2004 to 2005 lead to an estimation of 94±23 (using right sides) and 85±18 (using left sides) different animals.

Keywords : Cetacea, Ligurian Sea, Population Dynamics.

Introduction

Cuvier's beaked whale is a poorly-known cetacean species and stranding data indicates that the beaked whale is present all along the Ligurian coast. *Ziphius cavirostris* has been considered common in the Ligurian sea since the sixties but no estimation of population size was carried out until now. This species has hardly been studied, chiefly due to his elusive behaviour. This population, as other population of marine mammals, is subject to different and intensive human activities so conservation and management strategies are needed. An integral part of any management strategy is the assessment of the individual number of the population and any trends in abundance [1]. In order to fill this gap this paper presents the results of a preliminary mark-recapture study, to estimate the absolute size of the population of cuvier's beaked whale in these area.

Materials and methods

Photographs were taken from 1998 to 2005 in the Ligurian Sea (Figure 1), during scientific surveys operated by the Department of Biology of the University of Genova and by Woods Hole Oceanographic Institution (WHOI) scientists; during daily whalewatching cruises operated by bluWest. The sampling protocol was to shot as many animals as possible, from both right and left sides, in each herd. The individuals were identified from features such as nicks, scrapes, scars, deformities, and epidermal disease on both their dorsal fin and flanks. Were considered marked only individuals showing one long-lasting mark at least, as described by Ballardini et al. 2005 [2].

All pictures, obtained using 35mm cameras equipped with 100-400 zoom lenses, were examined and ranked according to their quality, from 1 to 6, with 6 representing the highest quality [3], and placed on file. Only photos ranked as ≥ 3 have been used in the analysis.

The data collected during 2004 and 2005 were used to calculate the population size and the analysis were estimated with CAPTURE program, using the model M(h) Chao which supposes an individual heterogeneity in capture probabilities. To obtain the variance and the standard deviation it was applied the method proposed by Wilson and Hammond [4].

Results and discussion

During surveys 90 sightings of cuvier's beaked whales heard occured. 52 different hight marked individuals were identified using the left side and 53 by the right side. The estimates of the proportion of hight marked whales for these data set are 0,72 (right) and 0,77 (left) of the whales, these values are greater than the ones found in other species of the ziphidae family, like *Hyperoodon ampullatus* [3]. The estimates of the total number of the cuvier's beaked whales in studied area, during 2004 and 2005, are 94±23 (mean ± st.deviation; cv= 0,24) for the right side and 85±18 (cv= 0,21) for the left side, confirming *Ziphius cavirostris* as common species in the northern Ligurian sea.

References

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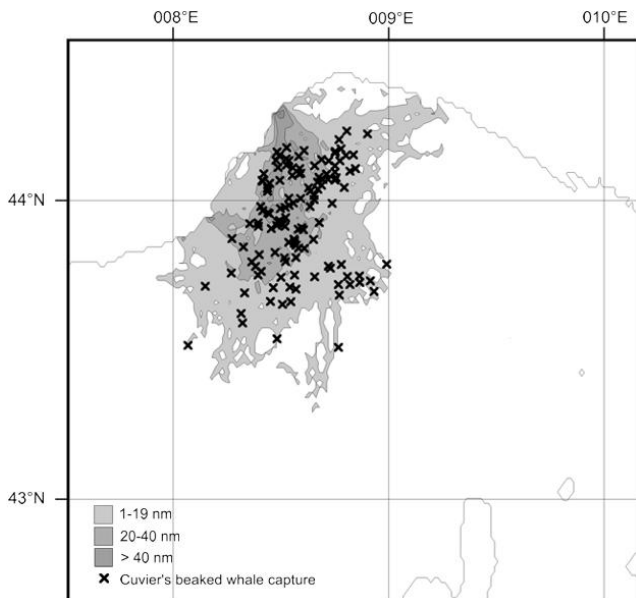
Fig. 1. Map showing the study area divided in cell units of 1,4 nm^2. Effort distribution represented as number of nautical miles surveyed by cell.