



PRESENCE AND ABUNDANCE OF BOTTLENOSE DOLPHINS ALONG THE EAST LIGURIAN COAST IN RELATION TO THE PLEASURE BOATING

Eleonora Manfredini (1), Francesca Frau (2), Fulvio Fossa (3), Michela Bellingeri (3), Guido Gnone (3) and Fabiana Saporiti (4)

(1) Dipartimento di Biologia, Università degli Studi di Parma (2) DIPTERIS – Università degli Studi di Genova (3) Acquario di Genova, Area Porto Antico, Ponte Spinola, 16128, Genova (4) Università degli Studi di Milano

Introduction

This work investigates the presence and abundance of Cetaceans along the East Ligurian coast, in relation to the presence and abundance of the pleasure boat traffic. The study area is included in the Santuario Pelagos protected area, still being characterized by a high tourist activity (Fig. 1). The presence of Cetaceans in this coastal area has never been investigated and no data are available about the pleasure boat activity and its potential impact on the Cetacean fauna.

This research is part of the long term research programme named “Delfini Metropolitani”.

Aims

Analysis of the presence, habitat, home range and abundance estimate of *Tursiops truncatus* along the East Ligurian coast.

Analysis of the presence of *Tursiops truncatus* in relation to the pleasure boating.

Material and methods

Data were collected between January and December 2006 using a rubber boat (BWA, 5.10 m) equipped with an outboard motor (HONDA MARINE, 40 HP). Research tracks were recorded with GPS (GARMIN 12). A digital reflex photo-camera was used for individual photo-identification (NIKON, D70). For abundance estimate, we used the mark-recapture technique, using the Schnabel¹ and Schumacher-Eschmeyer² estimators.

Results

53 surveys were carried out for a total of 245 hours spent at sea (Fig. 2) and 29 sightings: 25 of bottlenose dolphins (*Tursiops truncatus*) and 4 of striped dolphins (*Stenella coeruleoalba*) (Fig. 3). 100 bottlenose dolphins were photo-identified in total: 40 in zone B and 60 in zone C. Photo analysis showed only 2 animals shared between B and C. In B 42 animals were estimated with Schnabel method and 43 with Schumacher-Eschmeyer method. In C 118 animals were estimated with Schnabel method and 144 with Schumacher-Eschmeyer method.

Discussion and Conclusion

According to the sighting points, the bottlenose dolphin habitat seems to be confined within the 100m isobath (but this may be partially overestimated by an unbalanced research effort). The pleasure boating activity is confined within 3 nm from the coast line. This produces a complete overlapping with the bottlenose dolphin habitat in zone A and B, where the 100m isobath runs close to the coast line and only a partial overlapping in C, where the 100m isobath runs more out to sea (Fig. 3). The home range analysis through the Minimum Convex Polygons³ (MCP) seems to identify two different home ranges for the dolphins sighted in zone B and C (Fig. 4). The dolphins living in zone B show a good level of residence. Also the abundance estimate gives very different results for the two zones (Fig. 5, 6).

References

- Schnabel, Z. E. 1938. The estimation of the total fish population of a lake. Amer. Math. Mon., 45(6): 348-352.
- Schumacher, F. X. & Eschmeyer, R. W. 1943. The estimation of fish population in lakes and ponds. J. Tennessee Acad. Sc., 18: 228-249.
- Mohr, C. O. 1947. Table of equivalent populations of North American Small Mammals. American Midland Naturalist, 37: 223-249.

Acknowledgments

We would like to thank Laura Frigerio for her wide support in the elaboration of this poster.

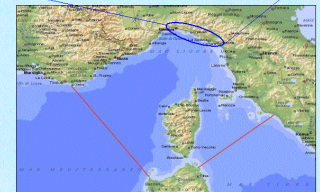
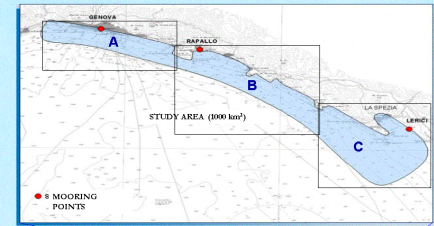
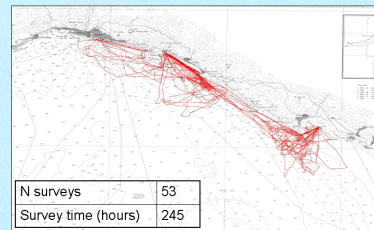
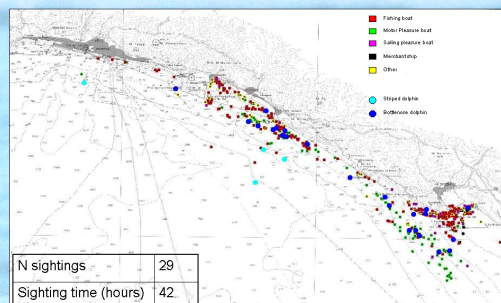


Fig 1 - Pelagos Sanctuary area of great naturalistic value with an extension of about 90,000 km²



| | |
|---------------------|-----|
| N surveys | 53 |
| Survey time (hours) | 245 |

Fig 2 - Research effort



| | |
|-----------------------|----|
| N sightings | 29 |
| Sighting time (hours) | 42 |

Fig 3 - Dolphin and pleasure boat sightings

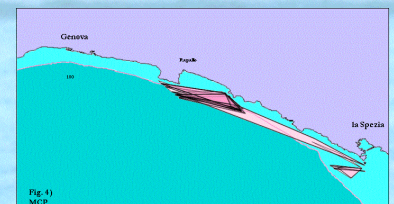


Fig 4 - Bottlenose dolphin home range with the MCP

| ZONE B | | | | | |
|-----------------------|-----|---------------------|------------|----------------------|----------------------|
| Sighting | N | Captured (Photo-ID) | Recaptured | Schnabel | Schumacher-Eschmeyer |
| 1 | 19 | 18 | 0 | | |
| 2 | 19 | 18 | 10 | | |
| 3 | 22 | 22 | 18 | 32 | 31.95 |
| 4 | 20 | 18 | 18 | 31.21 | 31.06 |
| 5 | 26 | 26 | 22 | 32.14 | 32.14 |
| 6 | 6 | 1 | 1 | 32.16 | 32.16 |
| 7 | 21 | 17 | 12 | 34.32 | 34.69 |
| 8 | 20 | 14 | 11 | 36 | 36.82 |
| 9 | 6 | 6 | 6 | 36.68 | 37.69 |
| | 159 | 139 | | 87,4% Photo-ID | |
| Final estimate Zone B | | | Schnabel | Schumacher-Eschmeyer | |
| | | | 41,96 | 43,11 | |

Fig 5 - Bottlenose dolphin abundance estimate in zone B.
* this is obtained relating the percentage of photo identified animals and the total number of animal sighted.

| ZONE C | | | | | |
|-----------------------|-----|---------------------|------------|----------------------|----------------------|
| Sighting | N | Captured (Photo-ID) | Recaptured | Schnabel | Schumacher-Eschmeyer |
| 1 | 2 | 2 | 0 | | |
| 2 | 15 | 4 | 0 | | |
| 3 | 2 | 2 | 0 | | |
| 4 | 8 | 4 | 0 | | |
| 5 | 6 | 6 | 0 | | |
| 6 | 18 | 15 | 6 | 66,66 | 66,18 |
| 7 | 1 | 1 | 1 | 60,14 | 60,34 |
| 8 | 8 | 8 | 5 | 63,08 | 46,77 |
| 9 | 15 | 15 | 7 | 57,21 | 54,49 |
| 10 | 14 | 14 | 8 | 57,59 | 78,02 |
| 11 | 2 | 2 | 1 | 74,65 | 79,53 |
| 12 | 12 | 9 | 0 | 34,21 | 114,53 |
| | 103 | 82 | | 79,6% Photo-ID | |
| Final estimate Zone C | | | Schnabel | Schumacher-Eschmeyer | |
| | | | 118,36 | 144,47 | |

Fig 6 - Bottlenose dolphin abundance estimate in zone C.
* this is obtained relating the percentage of photo identified animals and the total number of animal sighted.

