

Analysis of 23 years of Risso's dolphins photo-identification in the North-Western Mediterranean Sea, first results on movements and site fidelity

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Introduction

In the context of the 2010-2012 French Pelagos Sanctuary Research program, GECEM, in partnership with GIS3M and EcoOcéan Institut, conducted a study on the Risso's dolphin (*Grampus griseus*) population in the North-Western Mediterranean Sea. This study allowed to collect new photo-ID data and to compare two photo-ID catalogues, managed by GECEM since 1989 and EcoOcéan Institut since 1994, with data collected during dedicated and opportunistic surveys, mainly in summer and autumn.

Material and method

The study area lies in the North Western Mediterranean basin, which has been arbitrarily divided in 5 areas for this study: offshore (depth>2000m), Gulf of Lion, West Provence, East Provence and Liguria (Fig.1).

The two photo-ID catalogues managed by GECEM and EcoOcéan were compared (Table I). A capture history of all identified individuals was carried out and recaptures have been analyzed.

Table I. Summary of the two catalogues of photo-ID data analyzed for this study.

Catalogue	Period	Number of groups photo-identified	Number of pictures	Number of Right profiles	Number of Left profiles	Number of both sides identifications
GECEM	1989-2012	44	621	331	290	146
EOI	1994-2011	38	531	215	201	147

Catalogue's content

A fidelity rate for dolphins sighted at least 3 times was calculated using the following formula:

FR (Fidelity Rate) = Number of sightings of an individual in a specific area/Total number of sightings of the individual.

Results

Recaptures

82 sightings of Risso's dolphins have been realized by the two research groups since 1989 (Fig. 1), allowing 896 photo-identifications of 754 different individuals. 179 recaptures (20 %) were found concerning 122 dolphins. 68 % of the recaptured dolphins were observed only twice and 7 % at least 4 times. 16 % of the recaptures occurred in the same year and 84 % occurred in different years, ranging from 1 to 18 years.

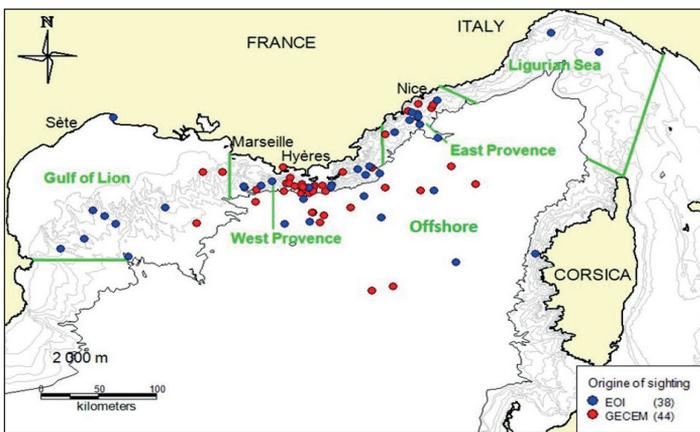


Figure 1. Groups of Risso's dolphins photo-identified by GECEM (red dots), EcoOcéan Institut (EOI, blue dots) and their partners (Cybelle Planète, SCS, WWF, FNH, Découverte du vivant, CRC and Planète Urgence) since 1989. Bathymetric contours are indicated with grey and black (2000 m) lines. The five different studied areas are represented in green.

Site fidelity

The fidelity rate calculated for the different areas shows a high fidelity for the Provence continental slope and a transient use of the offshore area (Table II).

Table II. Repartition of sightings and fidelity rate in the different areas.

Areas	Gulf of Lion	West Provence	East Provence	Liguria	Offshore	Mean
Number of sightings	23	194	67	2	15	
Number of individuals sighted	18	100	42	2	14	
Fidelity Rate Mean (SD)	0,58 (0,25)	0,78 (0,25)	0,63 (0,27)	0,50 (0,00)	0,42 (0,21)	0,58 (0,14)

Movements

Intra-annual

The mean distance between intra-annual recaptures is 33 km (SD=38; min=4; max=132) (Fig. 2), with a maximum of 132 km in 39 days (Fig. 3).

Inter-annual

Mean distance between two inter-annual sightings is 59 km (EC=61; min=2; max=309). 75 % of the recaptures occurred within 100 km from the other sightings of the individual and 63 % within 50 km. Two individuals show long distance movements (more than 200 km).

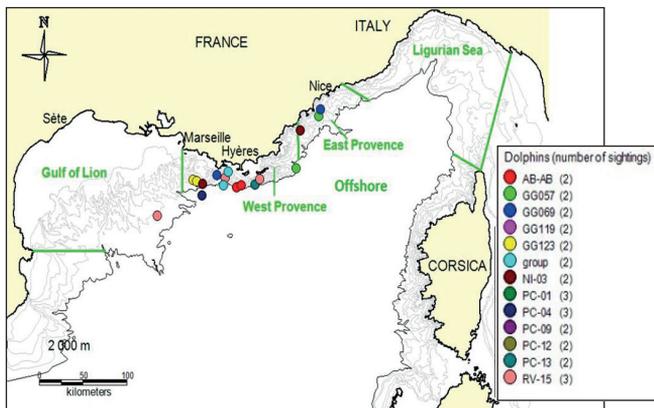


Figure 2. Map showing the localization of intra-annual recaptures in the studied area. Individual dolphins are represented by dots of different colors. Bathymetric contours are indicated with grey and black (2000 m) lines. The five different studied area are represented in green. The source of data are EcoOcéan Institut and its partners (Cybelle Planète, SCS, WWF, FNH) and GECM and its partners (WWF, Découverte du vivant, CRC and Planète Urgence).

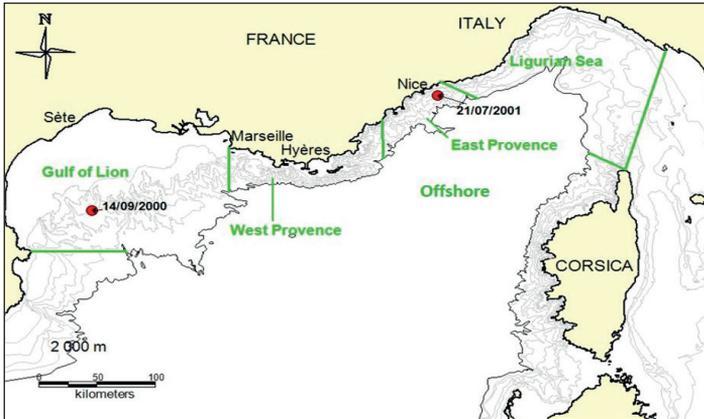


Figure 3. Map showing the localization and the dates of the two sightings of the dolphin GG227 (red dots) distant of 332 km. Bathymetric contours are indicated with grey and black (2000 m) lines. The five different studied area are represented in green. The source of data are EcoOcéan Institut and its partners (Cybelle Planète, SCS, WWF, FNH) and GECEM and its partners (WWF, Découverte du vivant, CRC and Planète Urgence).

Conclusion

This preliminary study shows the potential interest of long-term photo-identification for the study and management of this species. Fidelity rate of individuals recaptured for the Provence shows that animals attend this sector faithfully and in the long term confirming results from Bompar (1997) and David and Di-Méglio (1999). The hypothesis of a regular seasonal use of the west Provençale slope as a foraging area has to be confirm through further analysis. Association patterns study on this data set should provide information on social structure of this population. More data and collaboration are still needed to understand and characterized this poorly known species and population and establish its conservation status in the Mediterranean Sea.

Acknowledgements. All GECEM volunteers and partners (WWF-France, Parc national de Port-Cros, Planète-Urgence, Découverte du Vivant). All EcoOcéan Institut partners (Cybelle Planète, Swiss Cetacean Society) and volunteers.

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