SOCIAL STRUCTURE AND CONNECTIVITY OF BOTTLENOSE DOLPHIN (*TURSIOPS TRUNCATUS*) IN THE CAMARGUE MARINE PROTECTED AREA (2021–2024)

CM - 25

36TH EUROPEAN CETACEAN SOCIETY

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BACKGROUND

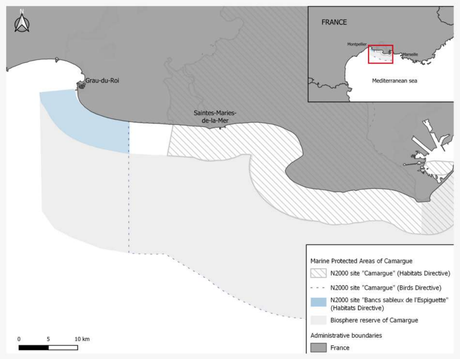


Fig. 1. Localisation of the study area.

This study investigates the **social structure** and **connectivity** of bottlenose dolphins within the Camargue Marine Protected Area (MPA) (Fig. 1) from 2020 to 2024. The aim is to assess **population dynamics and social associations** to support integrated conservation efforts. It contributes to the broader **TURSMED project** which is designed to support the sustainable management of dolphin populations across French Mediterranean MPAs.

METHODS

Occurence data:

Opportunistic data from Park surveys within the MPA

71 on effort boat-based surveys
(Beaufort sea state <3; swell <0.5m; speed 5-6 knots)

2020 2021 2022 2023 2024

36 opportunistic surveys aboard **whale-watching** vessels

Photo-ID:

Photographs were selected using an objective classification protocol based on image quality and the distinctiveness of dorsal fins.

Social structure:

Analysis were carried out using the R package *asnipe* and the Half-Weight Index (HWI). Only individuals observed on at least 3 occasions (n=33) were considered.

RESULTS

Across **83 sightings**, 214 individual dolphins were photo-identified from 2020 to 2024, with **62% sighted just once**. 38% were recaptured between 2 and 10 times (Fig. 2).

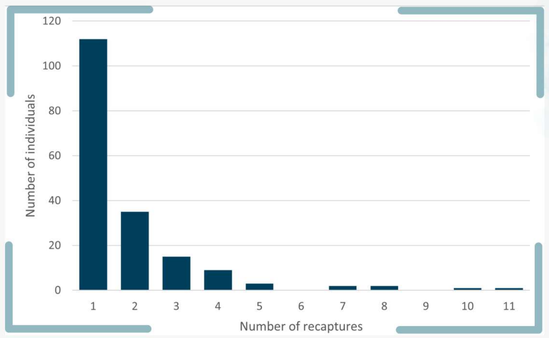
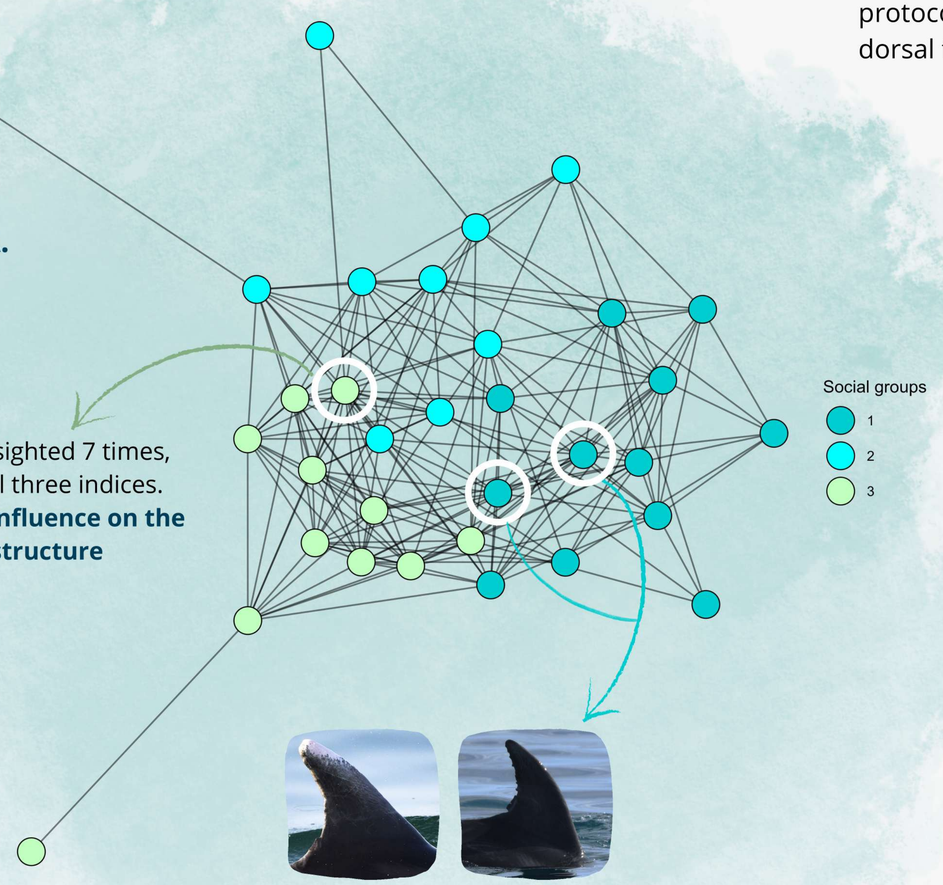


Fig. 2. Number of recaptures per identified individuals.



CamTT41, resighted 7 times, revealed in all three indices.
→ **Significant influence on the social structure**

CamTT28 and **CamTT23**, resighted 10 and 11 times, highlighted by the **betweenness index**.

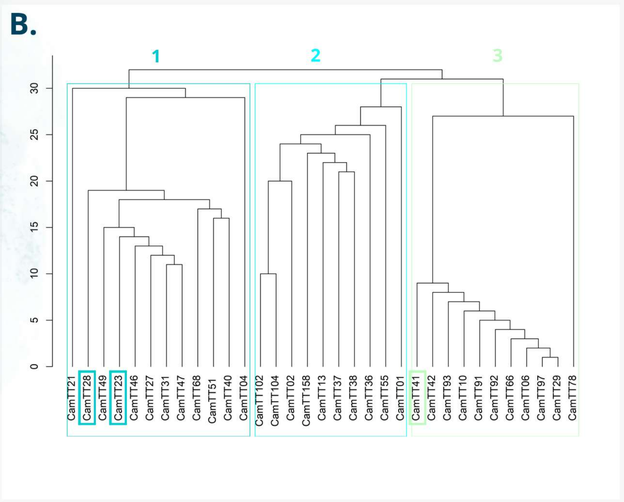


Fig. 4. Social structure of bottlenose dolphins in the study area between 2020 and 2024: **A.** Sociogram, and **B.** Dendrogram of the 33 individuals.

	Social clusters			Overall	Between	Strength	Eigen
	#1	#2	#3				
Nb. of individuals	12	10	11	33			
Mean HWI (SD)	3.154 (1.021)	2.819 (1.530)	4.582 (1.721)	3.528 (1.592)	15.005 (19.859)	3.529 (1.592)	0.444 (0.280)

Fig 3. Number of bottlenose dolphins grouped into 3 social clusters with mean HWI indices.

Social structure analysis revealed **three distinct clusters.**
Cluster #3 showed the strongest social associations (Mean HWI = 4.582). Overall, the network revealed **moderate cohesion** (Mean HWI = 3.528) and highlighted **individuals with high betweenness** centrality (Mean = 15.005), suggesting their **key role** in maintaining group **connectivity** (Fig. 3 and 4).

DISCUSSION & CONCLUSION

- **Dynamic social structure**: fission-fusion society with key individuals maintaining group cohesion.
- **Evidence of transient dolphins:** regular recruitment of new individuals.
- **Value of opportunistic data:** whale-watching surveys provide useful monitoring information.
- **Improved population insight:** comparing photo-ID catalogs across MPAs will help determinate residents from transients (*e.g.* Gulf of Lion vs. French Riviera individuals).

References

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