

20 years of bottlenose dolphin (*Tursiops truncatus*) photo-identification along French Provençal coast (Mediterranean sea)

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BACKGROUND

Bottlenose dolphin (*Tursiops truncatus*) is frequently found along the south-eastern coast of France. Since 1996, GECEM (Groupe d'Etude des Cétacés de Méditerranée) studies the population, investigating their distribution, movements and abundance through photo-identification.

METHODS

- Data were collected from 1996 to 2016 using dedicated surveys and opportunistic sightings along Provençal coast on inflatable or sailing boats.
- Boat surveys were carried out in good weather conditions (wind ≤ 3 Bf) with the average speed of 12 km/h. Digital single-lens reflex cameras had generally a 70-300 mm lens.
- Analyses were performed on medium and high-quality pictures and medium and well-marked individuals (Ingram 2000). Cormack-Jolly-Seber (CJS) capture-recapture models for open population were used to estimate abundance.
- An association index was calculated between individuals observed at least 3 times and seen at least once together (Whitehead & Van Parijs 2010). This concerned 75 individuals and 797 pairs.
- Data were matched with other institutions on Intercet, a web-GIS application on photo-identification.

CONCLUSIONS

- After 20 years of monitoring there is still a high number of newly identified individuals. Moreover, the individual capture histories clearly show that a majority of individuals can be considered as 'transient' in terms of occurrence, while others are more 'regular'. These results highlight the need to continue monitoring the population on a regular and long-term basis along Provençal coast.
- These abundance estimates for bottlenose dolphins in Provence provide a useful baseline for monitoring abundance trends over the years.
- Importantly, these data suggest that Port-Cros national Park is a calving area for bottlenose dolphins. Maintaining monitoring program is needed to identify key areas for bottlenose dolphins in north-western Mediterranean Sea.

RESULTS

- Between 1996 and 2016, more than **12 100 km** were spent on visual effort in Provence (**Figure 1**).

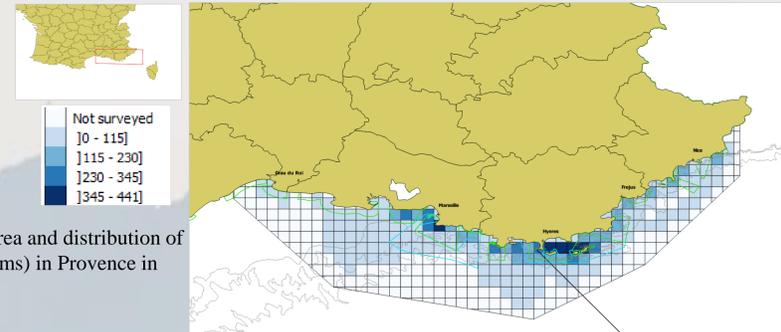


Figure 1: Study area and distribution of survey effort (in kms) in Provence in 2009 - 2016

- A total of **134 groups** of bottlenose dolphin were photo-identified either by GECEM (44.5%), sea users (30%) and partners (25.5%).
- Animals were distributed along the entire coast and were sighted **year round** (**Figure 2**).

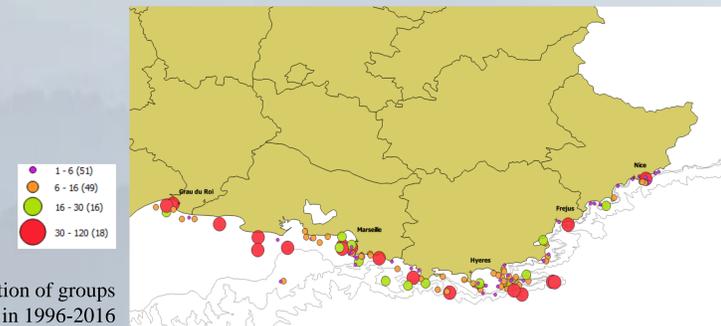
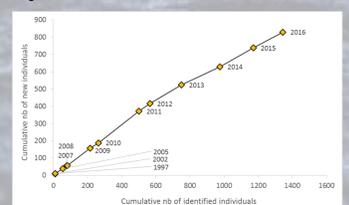


Figure 2: Location of groups encountered in Provence in 1996-2016

- A total of **827 different individuals** have been identified.
- Most individuals (**78%**) were seen **only once**, 181 twice, and 37 were seen at least 5 times (up to 37 times for individuals).
- Mean bottlenose dolphin abundance estimates for well-marked individuals was **36** (95% CI:18-64) dolphins and **91** (95% CI:50-155) when corrected by the proportion of unmarked ones **between 2013-2015** in Provence (Jourdan & al. 2015).
- Mean association index was **0.213** (SD = 0.114).
- 3 births** were highlighted in Port-Cros national Park.
- 53 individuals sighted in Provence were observed in the Gulf of Lion and 5 were also seen in Corsica, confirming **long distance movements**.
- After 20 years of study, the discovery curve **still show a marked increase** (**Figure 3**).

Figure 3: Discovery curve of individuals bottlenose dolphins photo-identified in Provence in 1996-2016



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