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# The Gulf of Catania: an eligible zone as Special Protected Area

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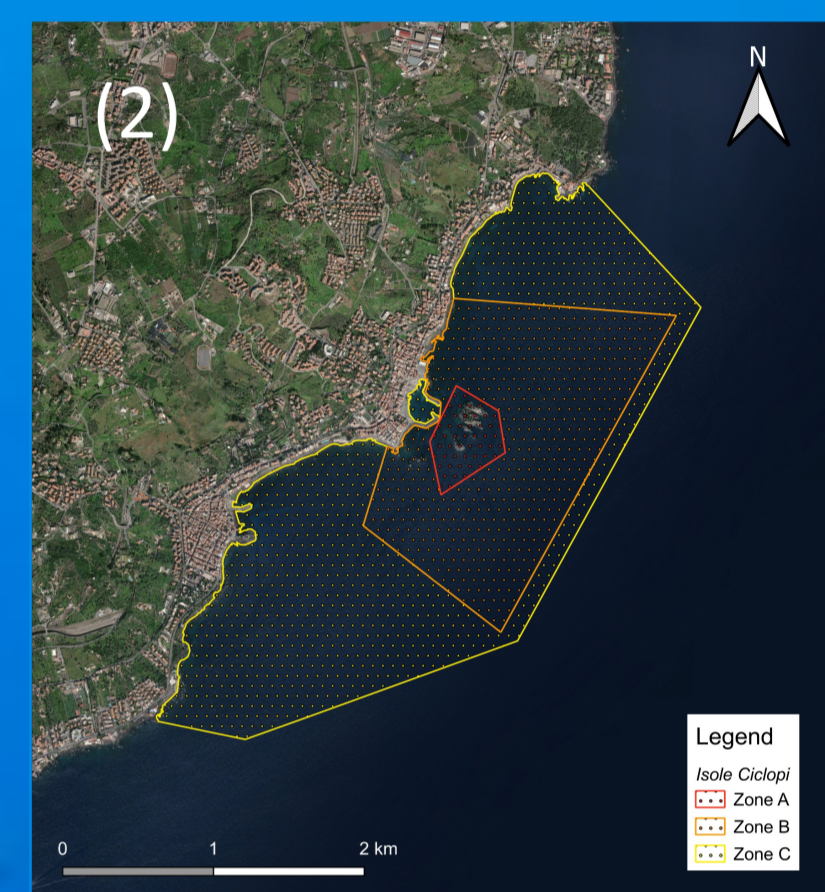
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## INTRODUCTION

This study explores the characteristics of the Mediterranean Sea with a specific focus on the cetacean species hosted by the Gulf of Catania. The research has been realized in the framework of the "Dolphin watching and Conservation in the Gulf of Catania" programme carried out by the Marecamp Association in Sicily since 2014. The fixed transect method was used to monitor dolphins in the area during the 2021 summer season. Species taken into consideration for the analysis are the most sighted in the Gulf: bottlenose dolphin (*Tursiops truncatus*) and striped dolphin (*Stenella coeruleoalba*).

## STUDY AREA: THE GULF OF CATANIA

The Gulf is part of the stretch of the Ionian Sea overlooked by Catania city. It is bordered by the imaginary junction that goes from the mouth of the river Fiumefreddo to the north, to Capo Campolato to the south (fig. 1). It extends for a length of 60 km and a width of almost 20 for a total area of 300 km<sup>2</sup>. The largest river is the Simeto which provides the main contribution of sediments and support a great primary productivity (Amore et al., 1979; Monaco et al., 2016). In the Gulf there's the MPA "Isole Ciclopi" established by an Interministerial Decree in 1989 (fig. 2). It has an extension of 628 hectares, while the affected stretch of coast is 6236 metres (mase.gov.it). There are five species of cetaceans spotted regularly: *Balaenoptera physalus*, *Physeter macrocephalus*, *Delphinus delphis*, *Tursiops truncatus*, *Stenella coeruleoalba*. Most of them are reported by the IUCN (International Union for Conservation of Nature) as under pressure and in serious threat of conservation.



## JURIDICAL INSTRUMENTS

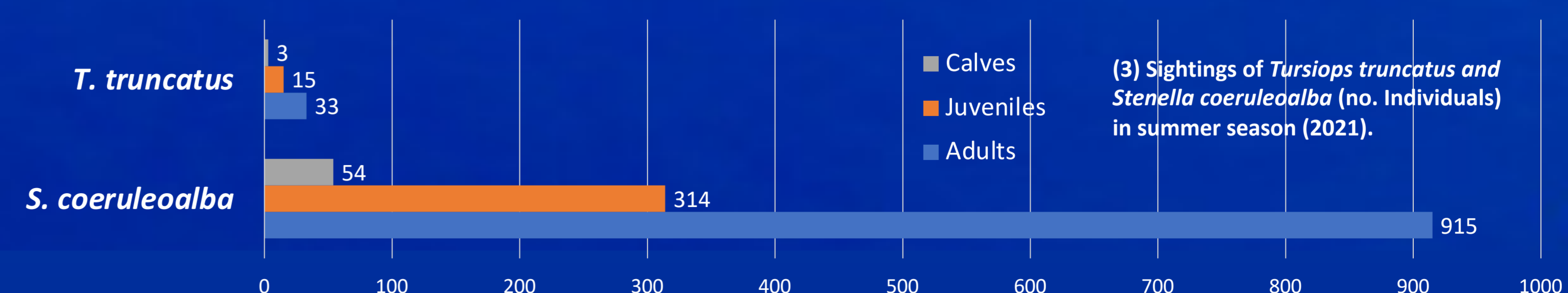
The initiatives undertaken by Italy for the protection of the marine ecosystem are reported, as a primary body, to the Ministry of Environment and Energy Security (Mase). The main protection of the ecosystem is guaranteed by the institution of MPAs (Marine Protected Areas). Other juridical instruments in force for Italy, Europe and the Mediterranean basin are: Directive 92/43 CEE, Bern Convention; SPAMI (Specially Protected Areas of Mediterranean Importance) Protocol; ACCOBAMS (Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area); CCH (Cetaceans Critical Habitat); IMMAs (Important Marine Mammals Areas), No-take zones, and Blue islands. Among the international initiative, it's also worth to mention the 30x30 campaign.

## MONITORING METHODS

Studies concerning cetaceans are characterized by field work conditioned by the ecology of the species observed and the environment in which they are found. Methods used in this study are: **Geographic Information System (GIS)**, **Photo-identification**, and **Line Transect (LT)**. Survey sheets compiled during the sightings onboard a 7 m inflatable boat include data on environmental characteristics, species, behaviour, and structure of the pod.

## DATA ANALYSIS AND RESULTS

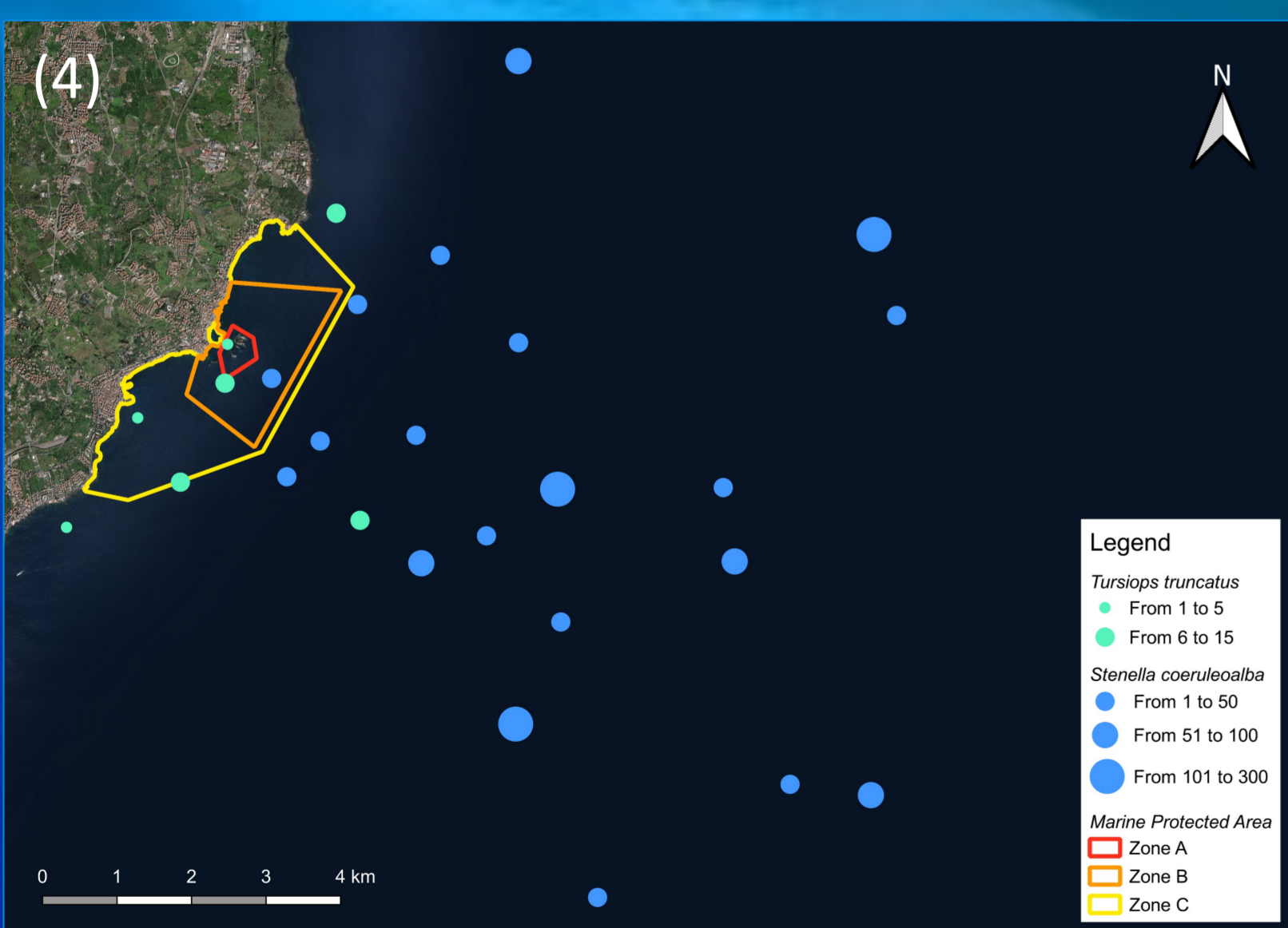
About the sightings of bottlenose dolphin, there's an average of only 6 specimens per survey. This is explained by the ethology of the species whose specimens are often found in groups of reduced number and also close to the coast due to the greater availability of prey. We also noticed a good compositional variability in the various pods, always including both adults, juveniles and calves. About the striped dolphin, groups are very numerous, recording up to 300 individuals in one survey (fig. 3). Consequently, also here, a great pod compositional variability has been highlighted. Bottlenose dolphins have been spotted near the Catania coast, inside and outside the MPA "Isole Ciclopi", while all the sightings of striped dolphins occurred beyond the MPA (fig. 4). Data collected reflect the social, behavioral, and ecological dynamics of these two species: bottlenose dolphin prefers coastal waters, while striped dolphin is easily found in areas with deeper bathymetry (around 200-700 m), and are used to make daily inshore-offshore migrations, often in relation to their favorite prey. Moreover, the farther from the coast the sightings took place and the greater numerical consistency we found in the herds. The presence of calves demonstrates that the area examined is not just a homerange where to play, feed and have social interactions, but also an important zone for reproduction and initiation into group life for cetaceans. In addition, several animals have been identified many times over the years as a demonstration of their constant residence in the area and, some of these, have scars in their body indicating signs of interactions with fishing gear or due to collisions with boats, underlining the risks for wildlife conservation present in the Gulf of Catania.



(3) Sightings of *Tursiops truncatus* and *Stenella coeruleoalba* (no. Individuals) in summer season (2021).

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## CONCLUSIONS

The analysis of the sightings of the most abundant species of delphinids in the Gulf of Catania suggest that it would be appropriate to deepen the investigations to acquire more information and monitor year round the presence of the most vulnerable species as cetaceans. The Gulf results a very anthropized area, so the risks for the conservation of cetaceans are very high due to maritime traffic, chemical-physical and noise pollution, overfishing, illegal fishing. It would be appropriate to better safeguard the Gulf of Catania and its species by allowing an expansion of the protected area portion through the establishment of an IMMA (Important Marine Mammal Area) or CCH (Cetacean Critical Habitat), or expanding the current boundaries of the MPA "Isole Ciclopi" starting from the retrieval coastal area "Grotte di Aci Castello" already identified by the Italian Ministry, and extending them even wider and offshore than the current zoning. Such a decision-making process requires the active involvement of local and national authorities and administrations. Moreover, it could help to update the ACCOBAMS priority maps and respond to the 30x30 international campaign, whose goal is to protect 30% of the oceans by 2030.