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1 **Random Forest population modelling of striped and common-bottlenose dolphins in the Gulf of Taranto**
2 **(Northern Ionian Sea, Central-eastern Mediterranean Sea).**

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9

10 **Abstract**

11 This study provides the first estimates of density and abundance of the striped dolphin *Stenella coeruleoalba* and
12 common bottlenose dolphin *Tursiops truncatus* in the Gulf of Taranto (Northern Ionian Sea, Central Mediterranean
13 Sea) and identifies the predictive variables mainly influencing their occurrence and concentration in the study area.
14 Conventional Distance Sampling (CDS) and the Delta approach on Random Forest (DaRF) methods have been applied
15 to sightings data collected between 2009 and 2016 during standardized vessel-based surveys, providing similar
16 outcomes. The mean value of density over the entire study area was 0.72 ± 0.26 specimens/km² for the striped dolphin
17 and 0.47 ± 0.09 specimens/km² for the common bottlenose dolphin. The abundance estimated by DaRF in the Gulf of
18 Taranto was 10080 ± 3584 specimens of *S. coeruleoalba* and 6580 ± 1270 specimens of *T. truncatus*, respectively.
19 Eight predictive variables were selected, considering both the local physiographic features and human activities existing
20 in the investigated area. The explanatory variables depth, distance from the coast, distance from industrial areas and
21 distance from areas exploited by fishery seem to play a key role in influencing the spatial distribution of both species,
22 whereas the geomorphological variables proved to be the most significant factors shaping the concentration of both
23 dolphins. The establishment of a Specially Protected Area of Mediterranean Importance (SPAMI) according the
24 SPA/BD Protocol in the Gulf of Taranto is indicated as an effective management tool for the conservation of both
25 dolphin populations in the Central-eastern Mediterranean Sea.

26

27 **Keywords:** cetaceans; models; conventional distance sampling; delta approach on random forest; conservation;
28 Northern Ionian Sea, central-eastern Mediterranean Sea.

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30 **1. Introduction**

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