Segregation of short-beaked common dolphins Delphinus delphis in European Atlantic waters inferred from ecological tracers

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Characterizing population structure is crucial for species conservation and is traditionally inferred from genetic markers. However, these markers provide a picture on a generation scale that may be unappropriated for short to medium-term management issues, especially in the case of long-lived marine mammal species. This study aims to evaluate the potential spatial differences in carbon (C), nitrogen (N) and sulfur (S) stable isotope ratios and in selected chemical contaminant levels, as ecological tracers, to investigate population structure of the common dolphin Delphinus delphis in the North-East Atlantic. This species is indeed subjected to high rates of bycatch in fishery engines each year, especially in the Bay of Biscay (BoB). Between 2017 and 2023, ninety-five (95) putative neritic individuals living and feeding on the continental shelf were collected by stranding networks of four European countries (France, Spain, Portugal and Ireland). In addition, ninety (90) two biopsies were collected on individuals from offshore waters in the BoB (beyond the continental slope) and from Madeira archipelago. Stable isotope ratios of C, N and S in skin and/or in muscle tissue (as short-term, few weeks) and medium-term (few months) tracers, and the concentrations of three families of organic contaminants (polychlorobiphenyls, polybrominated diphenyl ethers and hexabromocyclododecane) in the blubber (as long-term tracers, months to years) were analysed. In areas where it could be tested, the results showed significant differences between putative neritic and oceanic individuals for CNS isotopes in the skin, and for organic contaminants measured in blubber, suggesting different feeding habits at both short- and long-term scales. Regarding differences among individuals from continental shelves, significant differences were only noticeable for N stable isotopes in muscle, between neritic individuals from the BoB and English Channel on the one hand, compared to those from Spain and Portugal on the other hand. Overall, the results indicate an ecological

segregation between different areas in European waters, which should be taken into account when defining management units.