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Life-history traits variation of the North-East common dolphin population evidenced through cross-sectional monitoring

The usual methodology for obtaining demographic information on populations is the long-term monitoring of marked individuals. The use of this approach makes it possible to highlight the influence of factors, such as environment and additional mortality, at the individual and population levels on the demographic parameters. However, some animal species cannot be monitored individually on a long-term basis. To obtain demographic information on the populations associated with these species, it is necessary to rely on another type of monitoring, which is cross-sectional monitoring. This type of monitoring involves both the collection of age-at-death data from carcasses and important underlying assumptions. These data can be collected on toothed marine mammal species that are accessible through strandings. The common dolphin is a delphinid species associated with high conservation stakes at the European level. Demographic data related to the North-East Atlantic population are almost non-existent due to the impossibility of tracking individuals (long term monitoring). Age-at-death and reproductive-status-at-death data were collected on common dolphins stranded on the French seashore between 1997 and 2019. The data collection protocol was based on stratified random sampling that allowed to represent the structure of strandings data on size, year of death, cause of death and sex ratio in order to minimize the representability bias. Then we used a newly modelling approach based on regression that allows to estimate survival and reproductive parameters from collected data considering covariates, cohort effects and additional mortality. Based on the estimates, a demographic projection was made using a Leslie matrix model. This work is the first to show a change in the life history traits of the common dolphin, in terms of survival and reproduction, over time using cross-sectional monitoring. It appears that the population seems to survive less well and mature earlier. It is also the first work on this species to show the effect of an additional source of mortality on age-specific survival. This work constitutes a valuable contribution from an applied point of view, by feeding into management policies, and also from a fundamental point of view by raising the question of the use of cross-sectional monitoring.