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Body condition index and relationships between body weight and morphological measurements in harbour porpoises in Swedish waters

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Abstract

In this work we have used data provided by The Swedish Museum of Natural History from necropsies of over 800 harbour porpoises (Phocoena phocoena) found dead or that have been caught as by-catch in fishing gear between 1975 and 2022. The data have been collected as part of the project "Health and Disease Monitoring of Marine Mammals" by The Swedish Museum of Natural History in collaboration with the (Swedish) National Veterinary Institute. We have used this provided data for three different purposes: 1) To get an insight in morphological differences between populations, the weight-length relationship for the Swedish population have been calculated and compared to the weight-length relationships calculated for other populations of porpoises. 2) As an aid in determine the health status of dead individuals residual body condition indices have been constructed using the animals weight, length and the day of the year the animal had been found. 3) By the means of log linear regression and partial correlation, we have used measurements for circumference and blubber thickness to investigate how these relate to the animals weight and nutritional status. Results and conclusions: 1) Although no hypothesis testing was made to statistically confirm differences between populations, the weight-length relationships for other populations seemed to follow a steeper curve than those calculated for the Swedish populations. These differences were believed to mainly relate to the difference in growth between juveniles and adults and, to the fact that weight-length relationships were calculated for different classes of animals. 2) In testing, the residual body condition indices were shown to be useful in estimating an individuals nutritional status. However, there were indications that the residuals overall were to low and further testing may be necessary. 3) In the log linear regression the circumferences measured anterior of anus were found to correlate strongly with the animals weight. Blubber thickness were found to correlated poorly with weight in the log linear regression. The partial correlation was found to not be a very useful method to explain the animals weight with measurements of circumference and blubber thickness.

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