BOTTLENOSE DOLPHIN PRESENCE IN A MARINE FISH FARM FROM THE NORTH WESTERN COAST OF SARDINIA

PRESENZA DEL TURSIOPE PRESSO UN IMPIANTO DI MARICOLTURA NELLA COSTA NORD OCCIDENTALE DELLA SARDEGNA

Abstract – The objective of this study was to determine the main variables that can influence presence and abundance of the bottlenose dolphin (Tursiops truncatus Montagu, 1821) near an offshore marine fish farm of the North western coast of Sardinia (Gulf of Alghero, Italy). Based on the results obtained in this study, we can evidence that same factors influence the seasonal presence of dolphins in offshore fish farm: water temperature, water transparency and anthropogenic impact (presence of recreational boats).

Key-words: marine mammals, aquaculture, habitat use, behaviour.

Introduction – Mariculture, in particular intensive fish farming, is an activity that has grown considerably in the Mediterranean sea over the last twenty years (UNEP/MAP/MED POL, 2004). As a consequence, new habitats have been created causing a dispersal of organic waste and nutrients that attract numerous predators. Several studies have examined the effects of inshore and offshore marine fish farms on bottlenose dolphin populations (Diaz Lopez et al., 2005; Watson-Capps & Mann, 2005; Diaz Lopez & Shirai, 2007). The objective of this study was to identify the main variables that can influence presence and abundance of the bottlenose dolphin (Tursiops truncatus Montagu, 1821) in proximity of an offshore fish farm located in the Gulf of Alghero (North western Sardinia, Italy).

Materials and methods – This research was carried out from August 2008 to May 2009 using a 5.10 m motor boat at the fish farming facilities of “La Maricoltura Alghero s.n.c.” located in the Gulf of Alghero (40°33.671’ Nord - 008°16.144’ Est; Fig. 1). Observations were carried out at intervals of 20 minutes for a total sampling effort of 100 hours. The variables considered were: dolphins presence/absence, water temperature (°C), water transparency (m), wind speed (m/s), recreational boats and gillnets. Data were analyzed with Non-Parametric Multivariate Analysis of Variance (NPMANOVA) to test if there were significant differences between presence and absence of the bottlenose dolphins in the neighbouring of the fish farm. Principal components analysis (PCA) was than used for finding variables which accounted for much of the variance. Statistical analyses were performed using Palaentological Statistics (PAST) Version 1.35.

Results – During this study 300 groups of observations (25 during the morning, 25 in the afternoon and 25 in the evening, corresponding to 75 samples ’ season) were selected at random among those carried out in total. Dolphins where observed year round during the study period in the 22% of the samples analyzed, but there was a clear seasonal trend in their occurrence. NPMANOVA detected significant differences and PCA showed that the presence of dolphins was related with lower values of water temperature, water transparency and number of recreational boats (source of anthropogenic impact).
Conclusions – This study evidenced the presence of bottlenose dolphins near an offshore fish farm in the Gulf of Alghero. Two main factors influenced the seasonal occurrence of *Tursiops truncatus* specimens in the neighbouring of the fish farm: environmental variables (i.e. temperature and transparency of the water) and anthropogenic impact (i.e. presence of recreational boats). The peak of dolphin abundance and their interaction with the fish farm observed during the fall-winter seasons could be related to the low availability of food in the Gulf of Alghero. On the other hand, higher marine traffic observed during the summer months could negatively influence the presence of dolphins in this area. These results can be compared with similar studies carried out along the North eastern coast of Sardinia once more confirming that bottlenose dolphins can frequently capitalize on aquaculture activities in Sardinia Island (Diaz Lopez et al., 2005; Diaz Lopez & Shirai, 2007).

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References


