IDENTIFICATION OF CRITICAL FACTORS AFFECTING THE DISTRIBUTION AND HABITAT USE OF BOTTLENOSE DOLPHINS IN KVARNERIĆ, CROATIA

C. M. Fortuna[1,2,3,4], D. Holcer[3,5], P. C. Mackelworth[3,6], A. Wiemann[3] and P. S. Hammond[1]

[1]Sea Mammal Research Unit, Gatty Marine Laboratory, University of St Andrews, St Andrews, Fife, KY16 8LB, UK (cmf1@st-andrews.ac.uk, psh2@st-andrews.ac.uk), [2]Tethys Research Insitute, Viale G.B. Gadio 2, I-20121 Milano, Italy, [3] Blue World Institute of Marine Research and Conservation, Zad Bone 11, 51551 Veli Lošinj, Croatia, www.blue-world.org, adp@blue-world.org, [4]Central Institute of the Marine Applied Research, Via di Casalotti 300, IT-00166 Roma, Italy, c.fortuna@icram.org, [5]Department of Zoology, Croatian Natural History Museum, Demetrova 1, HR-10000 Zagreb, Croatia, Drasko.Holcer@hpm.hr, [6]Department of Geography, 26 Bedford Way, University College London, London WCIH OAP, UK, pcm@pmackelworth.freeserve.co.uk

The Kvarnerić zone experiences heavy human exploitation, seasonally by tourism and year-round by small-scale fisheries, increasing yearly. This study analyses dolphin distribution and habitat use with an aim to provide information for the management of possible critical factors affecting the distribution of bottlenose dolphins in this area. The distribution of sightings and dolphin habitat use were investigated between March 1995 and September 2002. GIS was used to integrate data from a total of 332 sightings with submarine slope and variability, distance from the coast, and the distance to sites affected by high intensity human use, such as trawling areas, marine petrol stations, and tourist boaters' 'highways'. These parameters were considered within cells of 1000 and 2000 m^2 size. Habitat types were defined by using Cluster analysis and the spatial analysis tools of ArcView 3.2. Correlation with environmental and other factors were analysed by using Generalised Linear Models (GLMs). The number of sightings varied greatly between years, without any apparent trend, except for a significant decrease, of almost 50%, in 1996. The distribution of sightings showed highly significant annual and seasonal variability. GLMs indicated a significant negative impact of the variable related to the transit of speedboats ('highway') on the presence/absence of bottlenose dolphins. Two possible prime critical factors were suggested to cause such avoidance reaction: a) increasing level of noise, and/or b) high speed moving objects, inducing an anti-predator like response.