

Estimating population density and abundance of the protected seahorse species *Hippocampus hippocampus* and *H. guttulatus* in northeastern Korinthiakos Gulf.

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Important populations of the Mediterranean seahorse species (*Hippocampus hippocampus* and *H. guttulatus*) thrive in a site of northeastern Korinthiakos Gulf (Central Greece). Seahorses have excellent camouflage capabilities, remaining virtually immobile, changing color to match their background, and having skin filaments to blend better with their habitats. Hence their detection in visual surveys with strip transects is uncertain. To make an unbiased estimation of seahorse population density and abundance, detectability has to be properly accounted for. To achieve that, a mark-recapture distance sampling methodology with SCUBA diving was developed and applied in a study area of 34.5 hectares. Twenty-eight line transects were surveyed under a stratified sampling scheme by two independent observers (point independence configuration). The estimate of average seahorse detection probability, in transects of 4 m half-width, was 0.41. *H. guttulatus* was ~4 times more abundant than *H. hippocampus*; average population density (in individuals per hectare) was 11.3 (95% CI: 5.2–24.7) for the former and 42.9 (95% CI: 25.8– 71.3) for the latter species. The estimated abundance in the study area was 391 individuals (95% CI: 180–850) for *H. hippocampus* and 1478 individuals (95% CI: 890–2455) for *H. guttulatus*. The applied double observed mark-recapture distance sampling approach with SCUBA diving is proposed as an efficient and unbiased methodology for population density and abundance estimations of seahorses and other cryptic benthic species.