

Human influences on seahorse populations in the Ria Formosa lagoon, South Portugal

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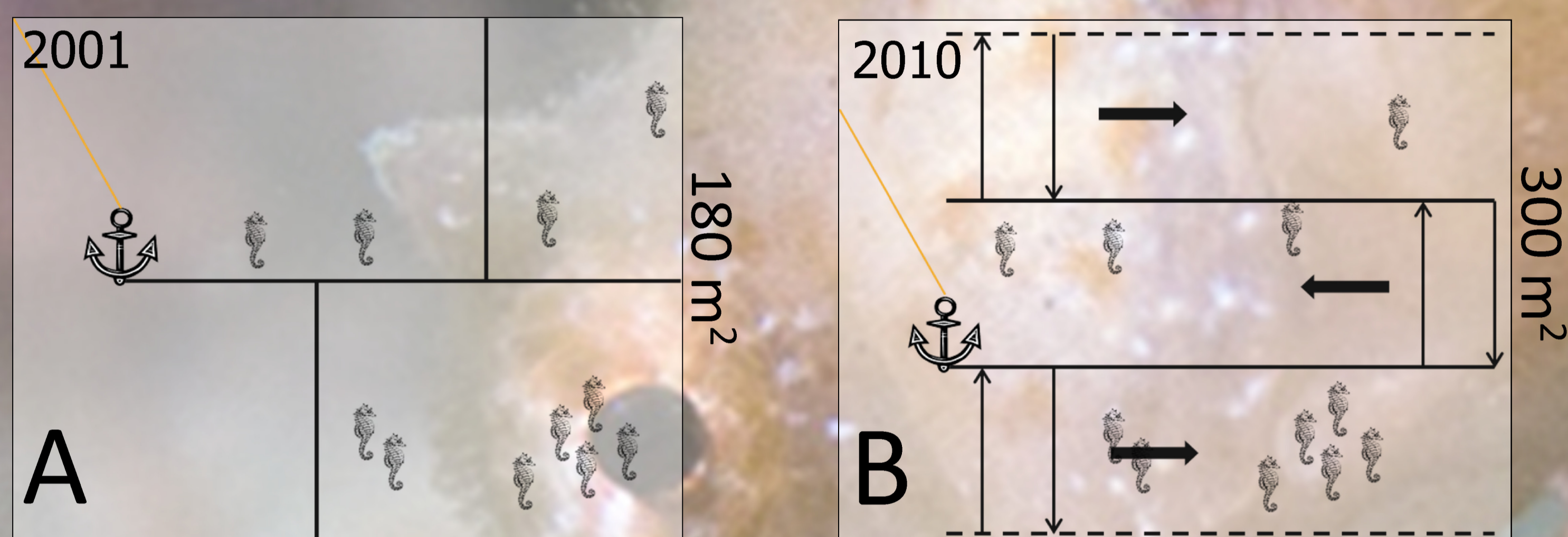


Objectives:

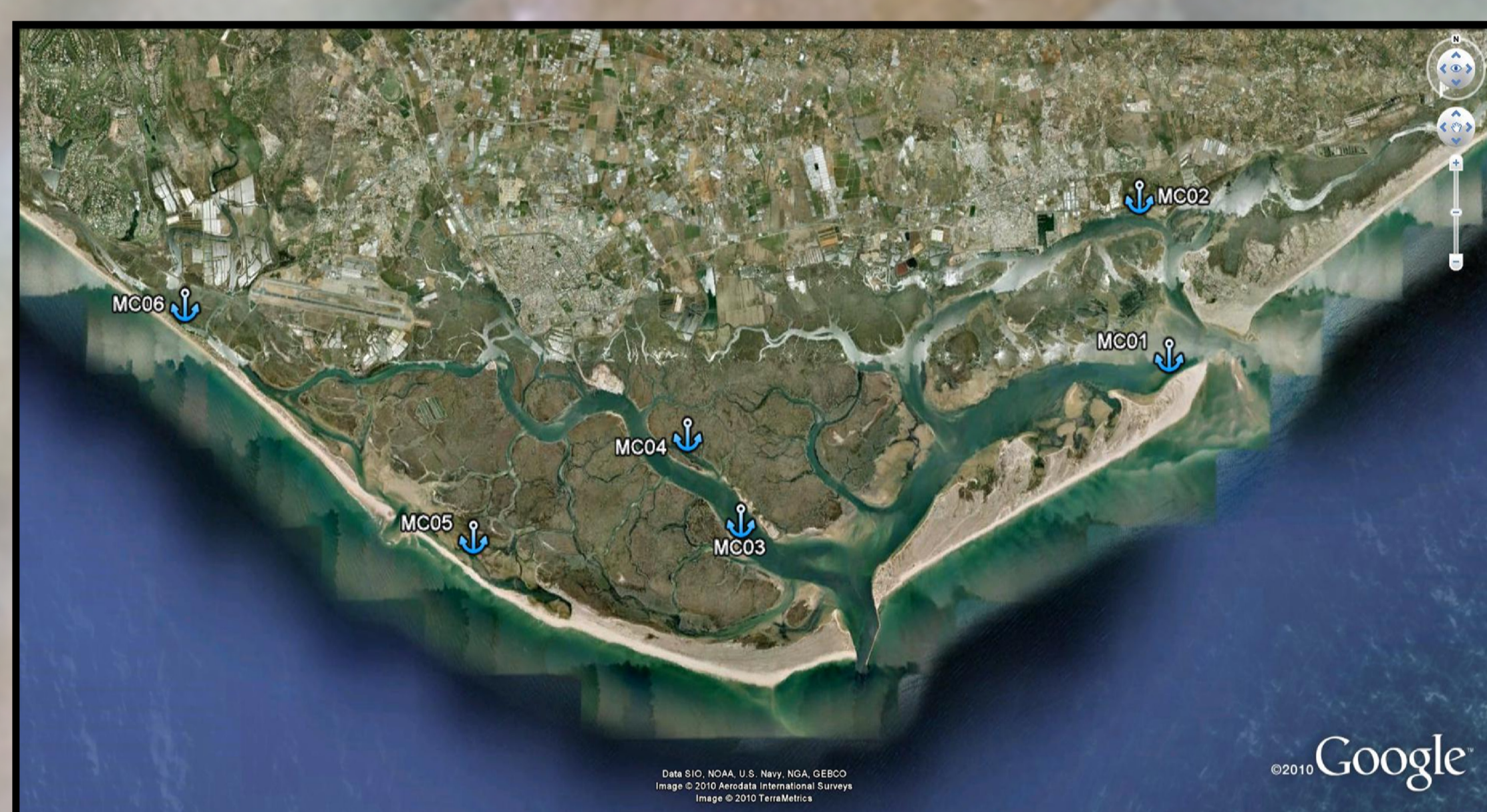
Assess the current status of the seahorse populations (*Hippocampus guttulatus* and *Hippocampus hippocampus*) and potential threats in the Ria Formosa lagoon, South Portugal.

1. Variation of seahorse populations over different temporal and spatial scales
2. Threats to seahorse populations in the Ria Formosa

Material and Methods:



As previous methodology was set for a higher density scenario (A), our underwater visual survey methodology was adapted for the bigger area (B).

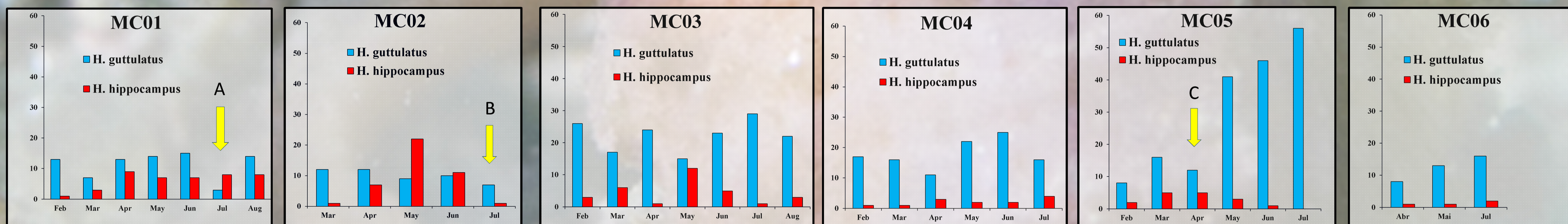


On the basis of previous research, we selected six focal sites in the Ria Formosa. These sites were chosen considering their higher seahorse density and site characteristics. Each site was surveyed on a monthly basis and data collected included seahorse species, size class, sex, substrate type, holdfasts and habitat description



Results:

These surveys found seahorse densities averaged 0.058 ± 0.025 seahorse.m⁻² for *H. guttulatus* and 0.014 ± 0.009 seahorse.m⁻² for *H. hippocampus* and maximum density was 0.19 and 0.07 seahorse.m⁻², respectively. These compare with previous reports of maximum densities of 0.51 and 0.07 for the two species (Curtis and Vincent, 2005). Pregnant males from both species were observed from May to August. Young juveniles (0-5cm) were found in March and August.



<i>H. guttulatus</i>	2001 2002	MC01	MC02	MC03	MC04	MC05	MC06	<i>H. hippocampus</i>	2001 2002	MC01	MC02	MC03	MC04	MC05	MC06
Minimum	---	0.005	0.023	0.040	0.053	0.027	0.027	Minimum	---	0.003	0.003	0.003	0.003	0.000	0.003
Maximum	0.510	0.047	0.040	0.083	0.097	0.187	0.057	Maximum	0.072	0.030	0.073	0.013	0.040	0.017	0.007
Average	0.073	0.038	0.033	0.061	0.075	0.100	0.042	Average	0.007	0.020	0.033	0.007	0.015	0.009	0.004

Discussion:

The absence of local boat traffic – banned by local authorities – may be correlated with a significant increase in seahorse numbers in site MC05 (C) (0.05 ± 0.02 and 0.16 ± 0.02 seahorse.m⁻²). In contrast, the significant decrease recorded in MC01 and MC02 (A & B) might be in response to the boat traffic pressure that seasonally occurs in this high tourism area. Our work suggests that boat traffic and other anthropogenic variables may be important in explaining changes in seahorse population numbers.

Recommendations on implementation of limits of boat traffic and protection of focal areas from human impact should be addressed as key component when considering the conservation of the local seahorse populations in this lagoon.

References:

Curtis, J. M. R. and A. C. J. Vincent (2005). "Distribution of sympatric seahorse species along a gradient of habitat complexity in a seagrass-dominated community." *Marine Ecology-Progress Series* **291**: 81-91