

NAUTICAL PRESSURES ON SEAGRASS MEADOWS PROTECTION ALONG THE WESTERN MEDITERRANEAN COAST OF SPAIN

ABSTRACT

The Marine Surveillance Service of the Generalitat Valenciana aims to collect information on the nautical activity in marine protected areas and to inform the public about the specific legislation, especially the prohibition of anchoring in seagrass meadows. To this perform, 18,901 nautical miles were covered in the Valencian Community from May to November 2023, mostly in Natura 2000 sites. A total amount of 23,435 anchored boats was identified; most of them were anchored on sandy bottoms (47.8%) and moored to buoys (39.7%). A minor proportion (7.8%) was detected on the seagrass meadows that include *Posidonia oceanica* and *Cymodocea nodosa* species. The boats anchored on the *P. oceanica* meadow were identified, informed of the ecological damage and, in consequence, the crime committed. A total of 41.7% searched an alternative anchoring, i.e. sand bottom, buoy, etc., while 2.3% ignored the recommendations and continued to anchor on the seagrass meadows. Due to the high number of boats and the limited working time, there is no record of the remaining boats (55.9%). The highest anchoring pressure was recorded in the marine protected area of the Marina Alta, located in the north of the Alicante province. In the previous period (year 2022), a total of 11,835 boats was registered, of which 15.6% were anchored on seagrass meadows. Therefore, illegal anchoring on seagrass has been reduced by 50.2% in only one year. This is the result of a positive change in the behaviour of nautical users. However, there are still users that ignore the legislation and continue to damage protected habitats. The illegal anchoring, currently observed in seagrass areas and generally focused on tourism purposes, has to be relocated to available buoys and sandy bottoms.

STUDY AREA

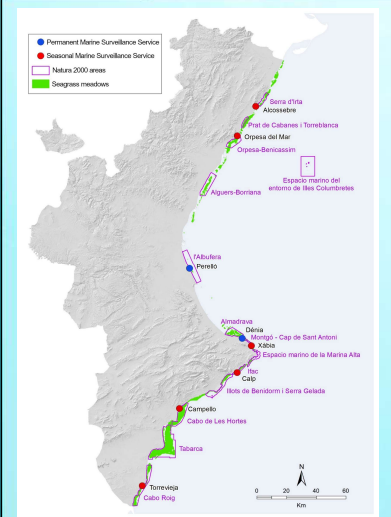


Figure 1. Map distribution of the Marine Surveillance Service boats and the Natura 2000 marine spaces of the Comunitat Valenciana.

MATERIALS AND METHODS

- 8 semi-rigid boats with 6 m length
- Collect data with a smartphone using *ArcGIS Field Maps app*.
- The data collected was represented using Geographic Information Systems with *QGIS 3.16.3* software.
- Use of the official cartography of seagrass meadows and a bathyscope for verification the anchor.



Figure 2. Examples of Tools and equipment used by the Marine Surveillance Service.

RESULTS

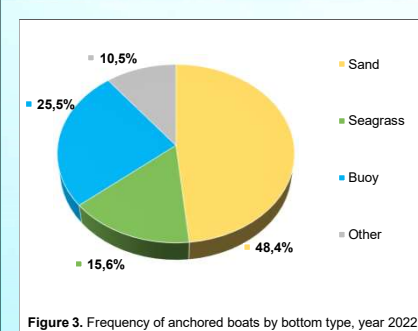


Figure 3. Frequency of anchored boats by bottom type, year 2022.

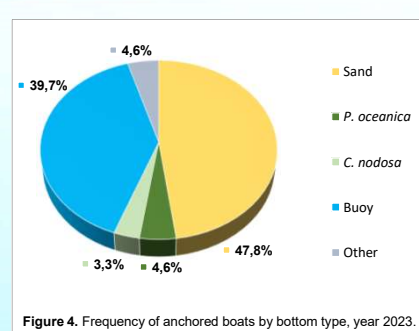


Figure 4. Frequency of anchored boats by bottom type, year 2023.

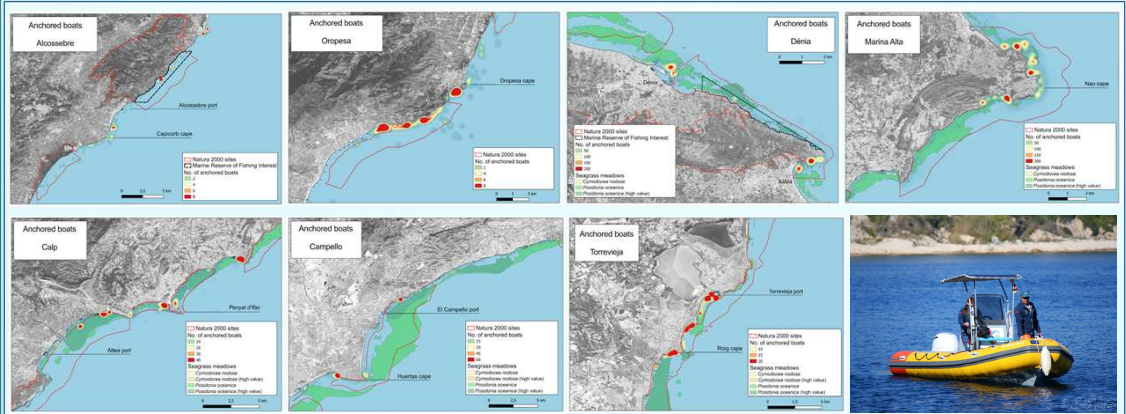
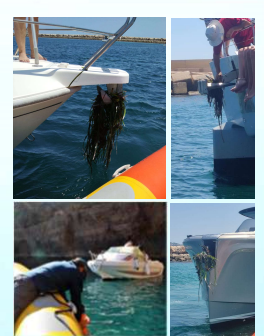


Figure 5. Heatmap analysis of the anchored boats per zone.

Table 1. No. of boats anchored on a *P. oceanica* registered per zone by Marine Surveillance Service

Marine Surveillance Service boat	Nº anchored boats on <i>P. oceanica</i> meadows
Alcossebre	2
Oropesa del Mar	30
Valencia	0
Dénia	147
Marina Alta	488
Calp	156
El Campello	63
Torreveja	185
TOTAL	1071

Table 2. Boats anchored on a seagrass meadow: 2022-2023 comparison.

Year	No. Boats anchored*	No. Boats anchored on a seagrass meadow	Percentage of boats anchored on a seagrass meadow	Nautical miles navigated by the service
2022	11,835	1,850	15.63%	9,754
2023	23,435	1,834	7.83%	18,901

* Anchorages registered in the Valencia Province have not been taken into account due to 100% were located on sandy bottoms)

DISCUSSION AND CONCLUSIONS

- The presence of a Marine Surveillance team to report on the ecological benefits of seagrass meadows and specific legislation is a powerful tool to bring about real changes in boating activities.
- The total number of registered boats has increased in recent years due to nautical tourism expansion.
- The anchoring observed in seagrass areas is focused on tourist purposes.
- There are still users and different companies that ignore the legislation and damage protected habitats.
- The official cartography has demonstrated to be a useful tool to facilitates the anchor activity.



ACKNOWLEDGEMENTS

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GVA FONDEA

The "App Fondea" shows the areas of *Posidonia oceanica* and *Cymodocea nodosa* where anchoring is prohibited.

