

EVALUATION OF A PASSIVE AUTOMATED ACOUSTIC TRACKING SYSTEM WITHIN A TEMPERATE MARINE PROTECTED AREA

David March¹, Josep Alós¹, Federico Cardona¹, Miquel Palmer¹, Amalia Grau², Elena Pastor², Marta Linde¹, Beatriz Morales-Nin¹, Antoni M. Grau³

¹ UIB-CSIC IMEDEA, Miquel Marqués 21, 07190 Esporles, Balears, Spain

² Laboratori de Investigacions Marines i Aqüicultura. Av. Eng. Gabriel Roca 69, 07157 Port d'Andratx, Balears, Spain

³ DG Pesca, Foners 10, 07006 Palma, Balears, Spain.

Examining movement and spatial patterns of artisanal and recreational targeted fishes within a marine protected area is essential for understanding population dynamics and constitutes a potential tool to evaluate spillover effects. Experimental approaches to analyse spatial movement patterns of *Serranus scriba*, a recreational targeted fish, were conducted using traditional tags, manual tracking (directional hydrophone) and automated tracking. The purpose of this work is to evaluate the efficiency/suitability of an automated acoustic tracking system based on an array of omnidirectional hydrophones within an open water study area.

The Marine Reserve consists of an Integral Zone where all fishing activity is banned, and a Buffer Zone where both artisanal and recreational fisheries are allowed but with some regulations. An array of 25 submersed omnidirectional units (SUR-01, Sonotronics) was deployed within both the Integral Zone and the Buffer Zone. Benthic habitat maps, marine reserve boundaries, bathymetry and human activity maps were included into a Geographic Information System (GIS) to design hydrophones allocation. Receivers were moored between 15m and 30m depth to optimize range detection. Testing equipment within study site was conducted to evaluate detection range and spurious detections.

Previous tag effect experiments were positively conducted to analyse suitability of *Serranus scriba*. Fish tracked were captured with hook and line within the study area. After capture, fish were transferred straight-away to fresh seawater tanks. Sonotronics transmitters (PT-3, 19 x 7.8 mm, 21 days autonomy; and IBT-96-1, 25 x 8 mm, 21 days autonomy) were surgically inserted into the peritoneal cavity. Fish were also tagged with conventional anchor-T tags (Floytag). Following full recovery, fish were released at their capture site.

Data collected from devices was stored in a MS Access database with customized queries to summarize data into temporal bins. Environmental parameters (moon phase, water temperature, and photoperiod) were also included into the database. Preliminary results seem to show an adequate spatial scale design of the array. Further work on data analysis, integration with other tracking systems and experimentation with other species such as *Diplodus annularis*, is expected.