

Long term monitoring of day-night fish assemblage at OBSEA

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Abstract – High frequency monitoring and the reducing of disturbance of sampling activities have a vital importance in the study of fish communities. The aim of this paper is to describe temporal patterns in habitat utilization by a coastal fish assemblage throughout the year 2012. A high frequency long term photo identification monitoring has been carried out with this objective. At about 63.000 individuals representing 28 species were identified, suggesting the occurrence of different day-night rhythms among them. Future comparisons with physical parameters will be developed to get a better understanding of their movement patterns.

Keywords- OBSEA, Cabled observatory monitoring, Coastal fishes, Photo-identification, Day-night rhythms.

INTRODUCTION

The monitoring of fish communities is of relevance in coastal areas in relation to the growing anthropic pressure. The recent development of cabled video observatory allowed the long term monitoring of fish communities [1] with the great advantage of eliminate the inevitable disturbance of sampling activity. Non-invasive and long-term monitoring should be carried out at high time frequency (hours) in order to link the variability in perceived community composition down to the day-night rhythms of individuals of local populations [2]. In this



Figure 1. The Expandable Seafloor Observatory, OBSEA. The videocamera's come is visible in the middle of the structure. The connection cable is visible in the bottom part.



Figure 2. Representative pictures obtained at the OBSEA during the period of study. **Up:** during the day; **down:** during the night.

study, we describe temporal patterns in habitat utilization in a North-western Mediterranean coastal fish assemblage throughout one year.

MATERIALS AND METHODS

Pictures were recorded at 30 minutes frequency throughout the 24h using a cabled video-observatory (Expandable Seafloor Observatory: OBSEA; Fig. 1) located off Vilanova i la Geltru at 20 meters depth. The study is focussed on one year (2012), from January 1st to December 31st, during that period more than 17500 have been acquired.

During the night hours, two spotlights were used to illuminate the area for few seconds only during picture acquisition to avoid constant light contamination (Fig. 2).

In all the pictures, we quantified to total number of individuals recognizing them at the levels of species when

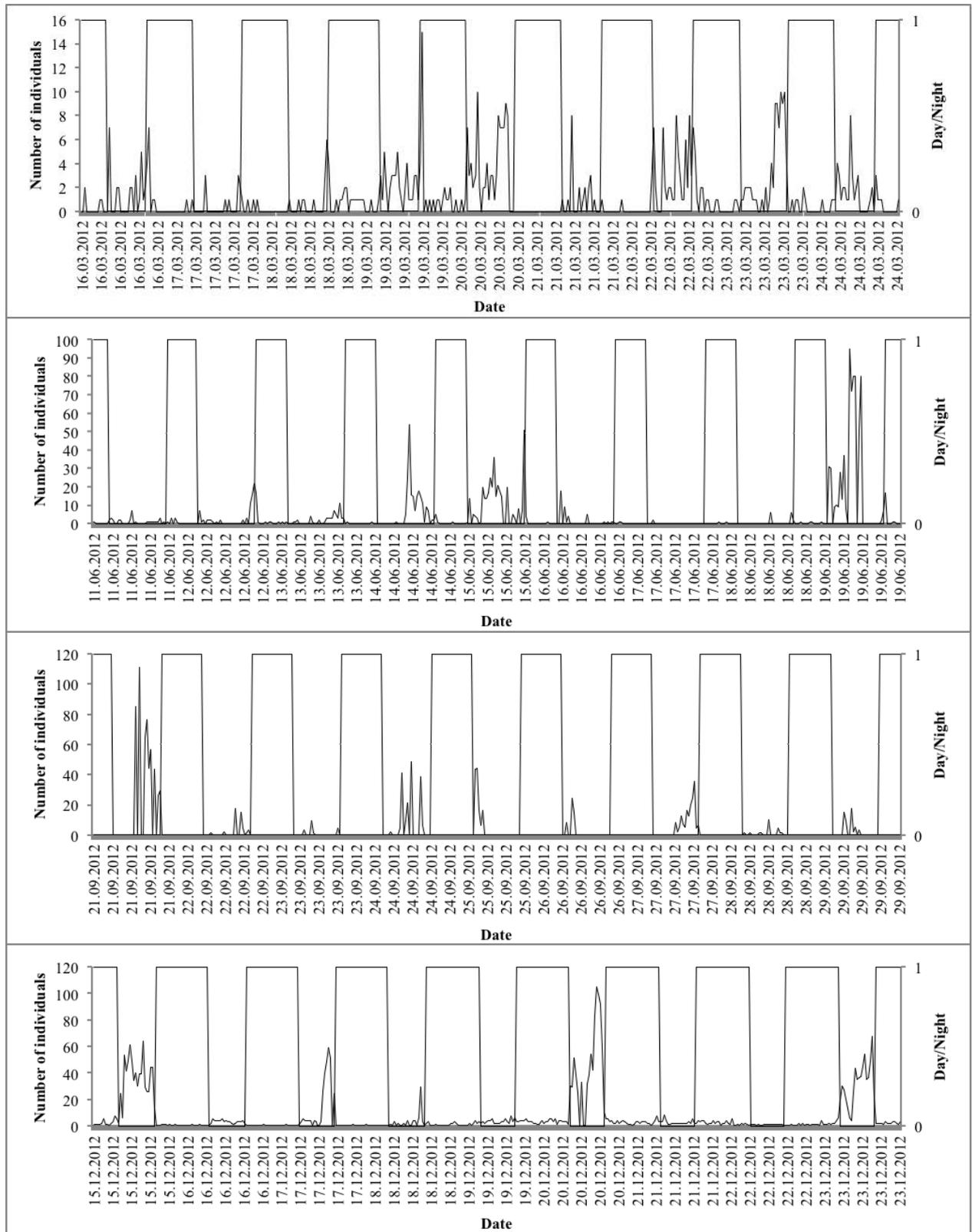


Figure 3. Representative results of fish counted during four different period of the study. The y axis shows the number of individuals counted while the x axis represents the time. Quadratic curves represent the photoperiod where values equal to 1 stay for the night.

possible.

RESULTS

Throughout the year at about 63000 individuals were counted and 28 species were identified among them. The most common species were *Spicara maena* (Linnaeus, 1758), *Chromis chromis* (Linnaeus, 1758), *Oblada melanura* (Linnaeus, 1758) and the genus *Diplodus*.

A preliminary screening of visual counts time series indicated the occurrence of different day-night rhythms among species, with more abundance of fish during the day than night. Peaks of abundance were detected at crepuscular hours (Fig. 3). Although the majority of species are more abundant during the day, some species such as whom belonging to the family *Apogonidae*, were more present during the night.

Due to technical problems there are gaps of missing data from July 26th to September 21st and from December 26th to December 31st. In addition the 5% of the pictures (at about 900 images) were lost due to problems with data acquisition.

The quality of images was also affected by natural phenomena. At about 25% (4592) of images were not useful for fish counting because of the elevated turbidity. Another problem for fish counting was the fouling that colonized the camera's dome even if the cleaning was performed every month. However, this problem affected less than 10% of the images (1768).

NEXT ACTIONS

Future comparison with physical parameters, such as temperature or photoperiod, and meteorological phenomena (obtained from the multiparametric sensors implemented at the OBSEA) will be carried out to get more detailed information about their influence in the already fish movement patterns reported in this study.

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