

# LANDINGS TREND AND SSB-R RELATIONSHIP IN THE NW MEDITERRANEAN BOAT SEINE SAND EEL FISHERY

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## Abstract

Sand eel fishery in the Catalan coast is a traditional small scale fishing activity. Over 2000–2015 landings displayed marked variations and a sharp decrease was observed in the last two years 2014 and 2015. A significant relationship was found between landings at the end of the fishing season in mid-December (taken as spawning stock biomass proxy) and landings at the opening of the fishing season in March (recruitment proxy). The regulations in force would not explain the landings decrease in the last two years.

**Keywords:** Fisheries, North-Western Mediterranean, Recruitment

The sand eel fishery targeting *Gimmamodytes cicereus* (locally called blue sand eel; *sonso blau*) is a traditional small-scale activity in the central and northern Catalan coast (NW Mediterranean). This fishery is carried out by a specific boat seine fleet, 26 vessels at present. Boats operate on a daily trip basis, going to fish five days a week early in the morning when sand eels leave their holes. The catch is sold the same morning upon the arrival of boats to port. *Gimmamodytes semisquamatus* (blond sand eel; *sonso ros*) is also present in the catch, in very low amounts. By-catch is low and most of it can be released alive [1]. The overall characteristics of the boat seiners are: length between perpendicular (m) = 8.05±1.75 and power (kw)= 42.55±20.60. Two or three fishermen work on board. To fulfil with the EC fishing regulations, a co-management committee was appointed in 2012 to carry out a scientific study that would support a management plan for this fishery [2]. This committee consists of public administrations, fishermen's associations, researchers and NGOs. The measures in force include, among others, a quota for the fishing season, monthly harvest control rules and the limitation of fishing effort. A closed season is implemented for mid-December to the end of February, in coincidence with the reproduction period of the target species.

Data on sand eel landings for the period 2000–2015 were obtained from the daily slips from the sale at the auction (data source: fishing statistics elaborated by the Fisheries Department of the Generalitat de Catalunya). Considering the dominance of *G. cicereus* in the landings (98% in weight), the data are assumed to correspond to this species.

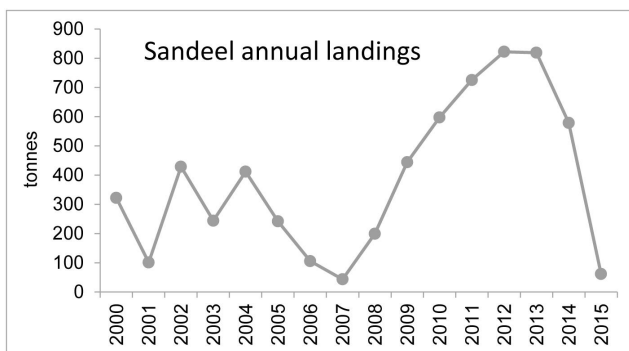


Fig. 1. Sand eel landings trend over 2000–2015 in the Catalan coast (NW Mediterranean).

Over the studied period, the annual landings fluctuated between around 100 annual t in 2001 and 2006, and a minimum of 43 t in 2007, and a maximum of 819 t in 2012 (figure 1). The fishery was closed in July 2015 because of the very low abundance of sand eel. The yield at the start of the fishing season has been shown to be significantly related to the yield at the end of the previous fishing season (Spawning Stock Biomass - Recruitment relationship;  $p < 0.01$ ; figure 2). Note that the highest value of this relationship corresponds to highest annual landings (2012–2013), and vice versa (lowest values in 2006–2007 and

2014–2015). The sharp landings decrease in 2014 and 2015, despite the limitations in catch and effort that were being implemented, seems to suggest that factors other than the fishing activity would be affecting sand eel abundance. In this regard, it is worth mentioning that within the Mediterranean, the distribution of sand eel is limited to the colder areas (e.g. our study area, Ligurian and Aegean seas), that is, they are at limit of their range, where the influence of environmental factors is likely to be more important than near the center of a species range [3].

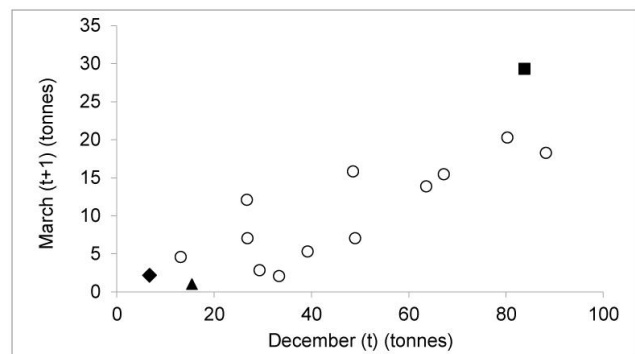


Fig. 2. Sand eel SSB-R relationship. Landings at the end of the fishing season in mid-Dec are taken as a proxy for the spawning stock biomass, and landings at the opening of the fishing season in March are taken as a proxy for recruitment (diamond 2014–2015; triangle 2006–2007; square 2012–2013).

## References

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