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Scientific, Technical and Economic Committee for Fisheries (STECF)
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Assessment of the implementation report of the management plan for boat seines ('sonsera') in the autonomous region of Catalonia (STECF-OWP-18-01)

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JRC110676

EUR 28359

PDF	ISBN 978-92-79-79375-2	ISSN 1831-9424	doi:10.2760/681058
STECF		ISSN 2467-0715	

Luxembourg: Publications Office of the European Union, 2018

How to cite: Scientific, Technical and Economic Committee for Fisheries (STECF) – Assessment of the implementation report of the management plan for boat seines ('sonsera') in the autonomous region of Catalonia (STECF-OWP-18-01). Publications Office of the European Union, Luxembourg, 2018, ISBN 978-92-79-79375-2, doi:10.2760/681058, JRC110676

Abstract

Commission Decision of 25 February 2016 setting up a Scientific, Technical and Economic Committee for Fisheries, C(2016) 1084, OJ C 74, 26.2.2016, p. 4–10. The Commission may consult the group on any matter relating to marine and fisheries biology, fishing gear technology, fisheries economics, fisheries governance, ecosystem effects of fisheries, aquaculture or similar disciplines. The Commission requested an assessment of the implementation report of the management plan for boat seines ('sonsera') in the autonomous region of Catalonia. The Scientific, Technical and Economic Committee for Fisheries (STECF) issued its advice by written procedure in January 2018.

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Background provided by the Commission

In accordance with Article 13(1) of Regulation (EC) No 1967/2006 (hereafter the Mediterranean Regulation) the use of towed gears is prohibited within 3 nautical miles (nm) of the coast or within the 50 m isobath where that depth is reached at a shorter distance from the coast. At the request of a Member State, derogation from Article 13(1) may be granted, provided that the conditions set in Article 13(5) and (9) are fulfilled.

A general condition for all derogations is that the fishing activities concerned are regulated by a management plan provided for under Article 19 of the MedReg. According to paragraph 5 of Article 19, the measures to be included in the management plan shall be proportionate to the objectives, the targets and the expected time frame and shall have regard to:

a) the conservation status of the stock or stocks;
b) the biological characteristics of the stock or stocks;
c) the characteristics of the fisheries in which the stocks are caught;

d) the economic impact of the measures on the fisheries concerned.

On 6 May 2014 Commission Implementing Regulation (EU) 464/2014 granted derogation from Article 13(1) of the Mediterranean Regulation for boat seines fishing sand eel and gobies in certain territorial waters of Spain (Catalonia). This derogation applied until 8 May 2017.

The derogation is based on the management plan for the artisanal fishing with boat seines of Catalonia (locally called 'sonsera'). The management plan was adopted on 27 March 2014 (Orden AAM/87/2014) and covers 5 years – from 2014 until 2019. The draft of this management plan was assessed by the STECF at its plenary session held in November 2013 and received Commission agreement in February 2014.

In line with the above Commission Implementing Regulation granting the derogation, Spain committed to communicate to the Commission, within 3 years following the entry into force of this Regulation, a report drawn up in accordance with the monitoring plan established in the management plan.

On 6 November 2017 Spain submitted a request to prolong further the derogation from Article 13(1) of the Mediterranean Regulation. The request is supported with the repot of the 3 years of the implementation of the monitoring plan established in the management plan.

Background documents provided by the Commission are annexed to the report:

- Annex I – Background documentation - MANAGEMENT PLAN FOR THE SONSERA (BOAT SEINE) FISHERY - Report after three years of implementation – EN
- Annex II – Background documentation - PLAN DE GESTIÓN DE LA SONS SERA - Informe a la fiinalización del terceer año de vigencia- ES

Request to the STECF

STECF is requested to review the implementation report submitted by Spain, to evaluate the scientific findings and recommendations, and provide any appropriate comments and advice vis-a-vis the conservation/ management measures proposed therein, in particular regarding their

conformity with the conservation and management requirements/ objectives stipulated in the Mediterranean Regulation (1967/2006) and in the CFP Regulation (1380/2013).

In particular, STECF is asked to evaluate data and information provided by Spain with the aim to assess:

1) Whether the following conditions set out in the Mediterranean Regulation are still met:

(a) There are particular geographical constraints, such as the limited size of coastal platforms or limited fishing grounds;

(b) The fisheries have no significant impact on the marine environment;

(c) The fisheries involve a limited number of vessels, with a track record of more than 5 years, and do not contain any increase in the fishing effort;

(d) The fisheries cannot be undertaken with another gear;

(e) The fisheries are subject to a management plan and carry out a monitoring of catches as requested in Article 23;

(f) The fisheries do not operate above the seagrass beds of, in particular, *Posidonia oceanica* or other marine phanerograms; In the event that the fisheries operate above seagrass beds, the purse-line, the lead-line or the hauling ropes do not touch the seagrass beds;

(g) The fisheries do not interfere with the activities of vessels using gears other than trawls, seines or similar towed nets;

(h) The fisheries are regulated in order to ensure that catches of species mentioned in Annex III, with the exception of mollusc bivalves, are minimal;

(i) The fisheries do not target cephalopods.

2) Whether the amendments proposed to the management plan, once it ends, are in line with the key requirements and objectives of the Mediterranean Regulation (1967/2006) and the CFP Regulation (1380/2013).

STECF response

General considerations

The Sonsera is a traditional small scale fishery in Catalonia targeting different species in different seasons. Most vessels target two species of sandeels (Gymnammodytes cicerellus and G. semisquamatus), and a few vessels target two gobies (Aphia minuta and Crystalogobius linearis.). The Sonsera fleet is constituted by 26 vessels less than 10m in length and less than 75kW engine power distributed along the Catalan coast.

Article 19 of the MedReg[1] addresses the adoption of MPs by Member States also for fishing activities utilizing boat seines, such as the Sonsera. The Sonsera target species are all small-sized and located in concentrated areas very close to the shore. Because of the small size of fish and their close proximity to the shoreline, catching these species requires an exemption from the minimum mesh size and the minimum distance from the coast stipulated in the MedReg. A MP should describe the status of the exploited resources and the measures proposed aimed at the sustainable use of the resources. Moreover, it should address other important aspects such as the

[1] COUNCIL REGULATION (EC) No 1967/2006 of 21 December 2006 concerning management measures for the sustainable exploitation of fishery resources in the Mediterranean Sea, amending Regulation (EEC) No 2847/93 and repealing Regulation (EC) No 1626/94

impact of fishing on sensitive marine habitats, especially on seagrass meadows, as well as on other species caught as by-catch during the fishing activities.

A first MP for seines targeting sandeels and gobies in Catalonian waters was formulated in May 2010. During the 38th Plenary in November 2011, STECF concluded that the two derogations requested, related to the use of "Sonsera", were insufficiently justified. STECF stressed that the MP did not include the necessary information to assess the impacts of the fishing activity on the status of the target stocks nor on associated species. STECF also noted that, based only on the information provided in the MP it was not possible to assess the impact on the Posidonia beds and other sensitive habitats, nor on by-catch species. Finally, STECF considered that it was not possible to evaluate whether the proposed limits in fishing effort and landings could guarantee sustainable use of these resources.

In 2012, a co-management model was implemented through a Joint Management Committee made up of representatives of the fisheries sector, scientists, representatives of NGOs, as well as members of the fisheries administrations of Catalan and Spanish Governments.

A new MP was submitted in 2013 including more information on the fishing activities and in particular on the by-catch composition, on the economic impact of the Sonsera fishery on fleet profitability, further data on the fishing activities, by-catch fraction and on spatial distribution of species. The main management measures included in the plan were:

1) A TAC for sandeels, and one for gobies and their partitioning by month fixed at the start of the season based on the analysis of the results of the previous fishing season. The annual TACs are divided into monthly fractions and the monthly quota divided among the authorised boats in equal proportions. The landings are monitored on a monthly basis analysing information of landings per boat per day. If the monthly landings of the fleet are less than 75% of the defined quota, the collective quota for the following month is reduced by 50%. If the threshold is not reached in that following month, the fishery is closed.

2) Fishing effort, in terms of number of vessels authorized, permitted duration of the fishing season and of the daily activity per vessel, was kept unchanged compared to previous years.

3) Enforcement of closed seasons aimed at reducing the impact of the fishing on spawning fish.

STECF, in PLEN-13-03 in November 2013, reviewed the new MP and acknowledged the improvements in data quality and quantity compared to the previous submission. The new MP included additional biological information, more details on by-catch, a better description of the fishing gear, fishing operations and on sorting procedures of the catch on board, and maps of fishing grounds. STECF noted that by-catch fractions of the boats targeting sandeels can be considered negligible; the fishing activity targeting gobies fish has larger proportions of by-catches, but considering the reduced number of vessels the impact of such fishing on by-catch resources is likely to be limited.

STECF considered that the information available was still not sufficient to support robust catch and fishing effort limitations, but considered positively the proposal of an adaptive MP with catch limits being set every year. Adoption of such a plan was expected to increase the likelihood of achieving sustainable fishing.

The MP for the Sonsera fishery on the Catalan Coast was approved by the EC in February 2014. It was agreed that an evaluation of the performance of the MP should be done at the end of the third year.

In October 2017 a new MP was presented by the Spanish Administration. STECF notes that the MP document does not describe a completely new MP, but refers to the previous plan approved and only proposes some specific changes to address fishers' concerns. Notable decreases in catch rates of some resources have occurred in the last 3 years for the most important species G. cicerellus. The main objective of the proposed changes is to avoid further closures of the fishing activity.

STECF was requested to evaluate the new MP in order to determine whether changes are consistent with all the conditions set out in the MedReg and the Common Fisheries Policy (CFP). The MP document includes data of the fishery for the period 2000-2016, but in particular data collected during the last three years (March 2014-December 2016) and details of the evolution of the fishing activity, the status of the stocks and lists the management measures adopted during the last three years.

The document also includes new information on fishing effort, catches, information on fishing fleet operation areas and depth of fishing, information on catch composition including by-catch, length frequency distributions of target species and of the main species of the by-catch, and biological variables such as sex and maturity.

The new document is structured in two parts. Part one contains the main decisions taken by the Co-management committee, the identification of some concerns and proposals for changes in the management of the fishing activity, which are discussed in more detail below. The second part is an Annex containing new detailed information on the fishing activities and on biological features, the by-catch composition, an evaluation of the economic impact of the Sonsera fishery and further data on the spatial distribution of gobies species in the area.

STECF observed that some of the new management measures within the new MP deal with several changes in management measures concern administrative issues that are unlikely to impact directly the stock status and fishing sustainability, nor the ecosystem. These changes are thus not evaluated here. The STECF evaluation covers only the measures of technical and scientific nature, which are likely to impact stocks and the sustainability of the fishery.

The first important proposed change in the new MP deals with the revision of the way TACs are defined and the dissolution of the boats' associations (i.e. associated vessels that configure the community management model). The monthly and annual minimum catches used as reference limits have so far been fixed for the whole fleet. These limits represent mean catch quantities for the entire fleet. However, individual vessels show different levels of activity and efficiency. If some boats fail to catch the minimum individual landings, they decrease the catch rate for the entire fleet and therefore may trigger TAC reductions. The proposal is thus to dissolve such associations and to quantify the achievement of the minimum catch rate at the level of single vessels. For the vessels that are not able to reach the fixed minimums, the quota reduction protocols will be applied only to them or they can stop this particular fishing activity.

A second proposed change deals with allowing for the grouping of vessels for sharing daily landings quotas. As such, vessels that already reached their own daily or weekly maximum quota could avoid having to discard fish by "slipping" (i.e. opening the net codend to release excess fish catches). The new procedure could also apply for vessels landing in different ports, considering that there are some ports where only a single vessel with a Sonsera permit is registered.

A third proposed change in the new MP relates to the use of part of the catch as bait for longliners. Although most of catch is used for direct human consumption, some (unknown fraction) of the sandeel caught with sonsera was traditionally used for providing live bait to small vessels using bottom-set longliners, targeting Dentex dentex. The new MP proposes that in periods of high sandeel abundance, small quantities of sandeels could be sold as live bait to these small-scale longliner vessels. This use of fish for live bait would require the transhipment of sandeels from the catching boat to the longlining boat at sea, in order to ensure high survival. However transferring live bait is incompatible with the enforcement of Article 20 of Council Regulation (EC) No 1224/2009 of 20 November 2009 and therefore this proposal would not be compatible with regulations.

STECF comments on whether the new management plans meets regulatory requirements

According to paragraph 5 of Article 19, the measures to be included in the management plan shall be proportionate to the objectives, the targets and the expected time frame and shall have regard to:

1)the conservation status of the stock or stocks;

STECF notes that there are no formal assessments of the status of the stocks caught with the Sonsera.

Regarding sandeel: Marked changes in availability and catches of sandeel were observed. This was especially true for G. cicerellus, with a peak in 2013 when landings were the highest recorded in the last 16 years, followed by a decline. (Figure 3.4.1 extracted from the MP report and reported below) The fishery was temporary closed in July 2015 until April 2016 due to poor catches in the period March – July 2015.

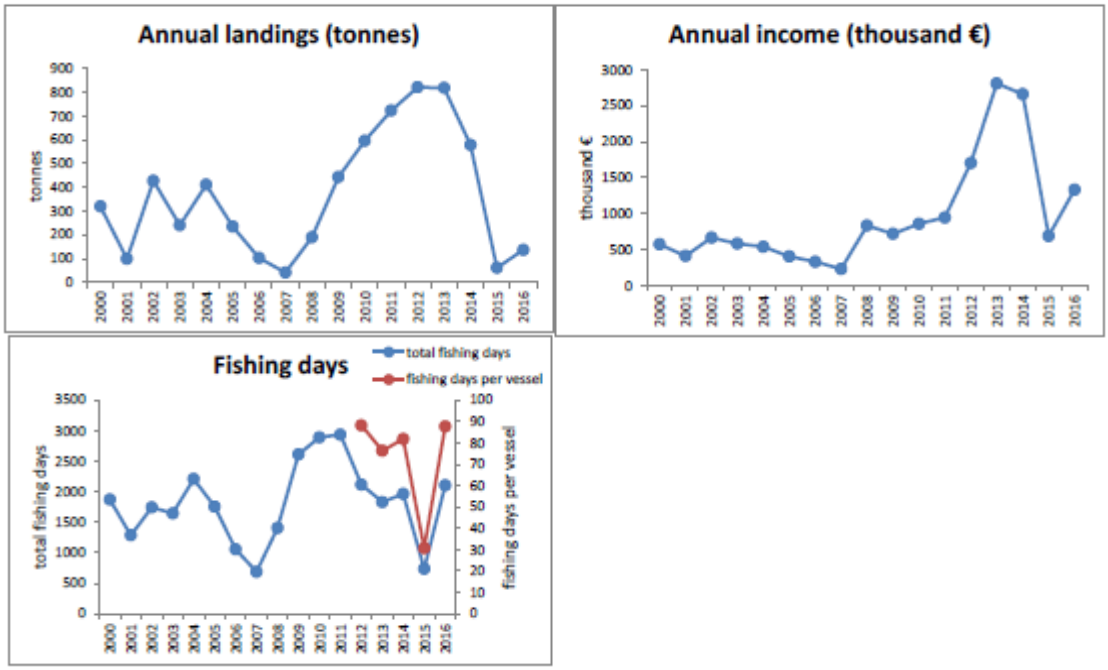
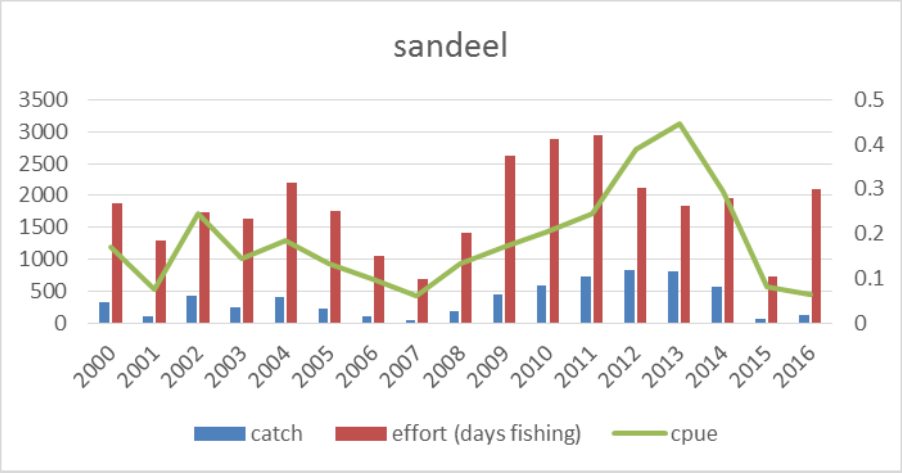


Figure 4.3.1. Sandeel annual landings, income and fishing days (total and by vessel). Input data in Table 4.3.1. Data source: Fisheries statistics of the Generalitat de Catalonia.



Comparing catches with effort based on the figure 4.3.1 above indicates a major drop in catch per unit effort (CPUE) after the introduction of the MP in 2014 (Figure above).

The MP report states that it is not possible to attribute such changes exclusively to fishing pressure and it argues that environmental factors also may have influenced such changes. To support this, the report notes a possible inverse relationship between mean winter temperature and the following year abundance of sandeel recruits (report figure 4.5.1 extracted from the MP report and reported below).

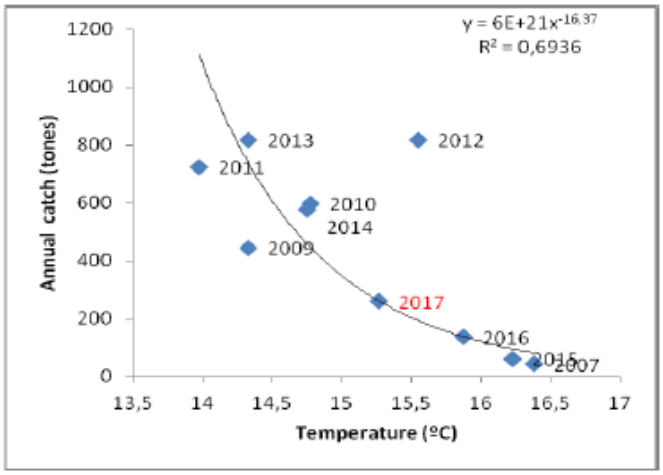


Figure 4.5.1. Relationship between the December temperature and catches the following fishing season. Catch for 2017 (in red) has been predicted by the regression model.

While environmental factors may potentially influence stock productivity and availability, STECF notes however that according to the report figure 4.3.1 above, fishing effort almost doubled just before the implementation of the first MP in 2010, which might have negatively impacted the sustainability of the sandeel species. Therefore, it is not possible to fully disentangle the environmental effects from the fishery effects. Additionally, STECF notes that the fishery seems to depend mostly on recruits according to the scientific monitoring. The length distribution may suggest that even in the good years (2011-2014), landings could be made of small individuals.

STECF notes that the MP annex includes some attempts to define F-based reference points and the current status only for sandeel species. The analyses suggest a status of overfishing. The assessment was based on a yield-per-recruit analysis based on a length cohort analysis using a pseudo-cohort and length-converted catch curves. STECF acknowledges this analysis, although the results remain uncertain because of the strong assumptions of equilibrium and stable recruitment, which is not fully compatible with the potential impact of changing winter temperatures discussed above.

STECF considers thus that the management approach followed since the revision of the MP in 2014 has not resulted in a sustainable exploitation of sandeels, and that the status of the stocks seems at risk. STECF also notes that the catch thresholds were based on years with exceptionally high catches and effort levels.

Regarding gobies: The landings of crystal goby Crystallogobius linearis declined after 2005 and small landings of this species are still reported in recent years (Figures 6.1.2 and 6.1.3 extracted from the MP report and reported below).

STECF notes that estimates of biomass of the transparent goby A. minuta using depletion models were presented in the previous MP. New stock assessments for this species have not been included in this new MP. STECF notes however that A. minuta has shown a fairly stable level of landings from 2001 to 2016 and fishing effort has also remained stable at a very low level, as

only 2 boats traditionally exploit this resource. Therefore, STECF considers that the stock is exposed to a light fishing pressure, suggesting a potentially sustainable exploitation of this resource.

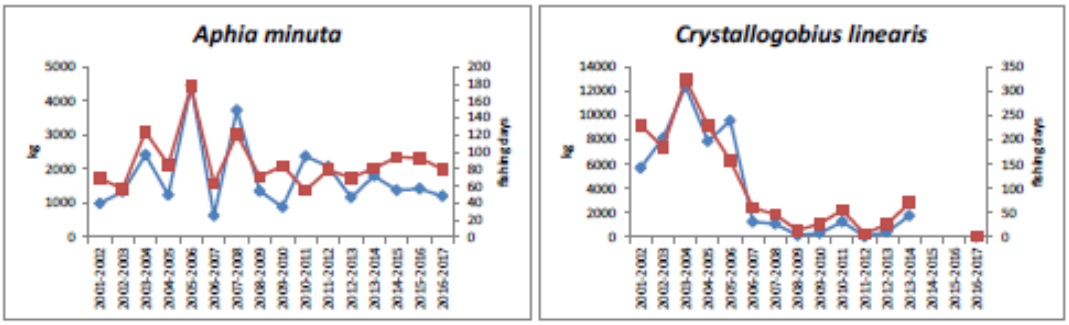


Figure 6.1.2. Landings (kg; in blue, left axis) and fishing days (in red, right axis) trend of transparent goby and crystal goby in the Catalan Coast over the fishing seasons 2001-2002 to 2016-2017.

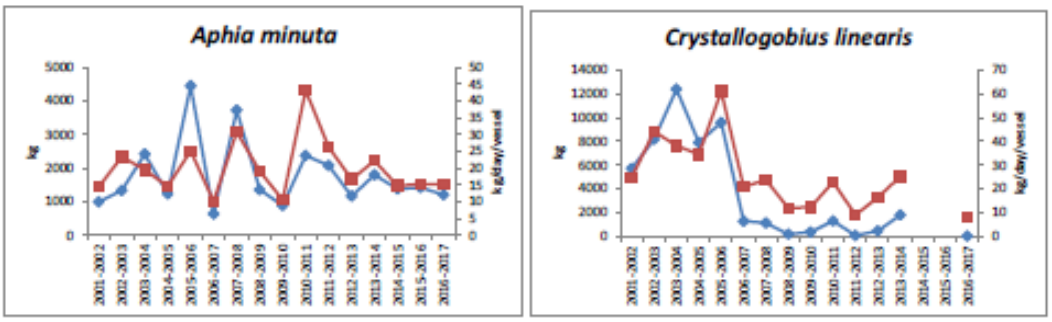


Figure 6.1.3. Landings (kg; in blue, left axis) and fishing season CPUE (kg/day per vessel; in red, right axis) trend of transparent goby and crystal goby in the Catalan Coast over the fishing seasons 2001-2002 to 2016-2017.

STECF concludes that A. minuta seems to be exploited sustainably, while sandeel species are not. Poor environmental conditions might reinforce this, and STECF expresses concerns on the potential risks of the collapse of the fishery of G. cicerellus.

2) the biological characteristics of the stocks;

STECF acknowledges the improvements regarding the quality of biological information of the target species. Analysis of the old and new data led to improved description of the biological features of the stocks exploited with the Sonsera, in particular of individual growth, length/weight relationships, reproductive cycles, spawning, recruitment periods and size of first maturity. Length frequencies of the monthly catches are also available, which suggest that sandeel catches are consituted of small individuals. These are useful for estimating growth parameters and may be used to some extent as indicators of changes in fishing pressure; nevertheless, the analysis is hampered by annual differences in the dates of the fishing season and in the recruitment timing, and also by the very short time series for most of the stocks.

The stock-recruitment relationship was explored for the G. cicerellus (Figure 4.4.2 extracted from the MP report and reported below). Catch per month were taken as proxies of abundance throughout the fishing season. At the end of the fishing season in December, the catch is mainly composed of adults and the computed monthly catches were considered a proxy for the Spawning Stock Biomass (SSB) and the monthly catches of March of the next year, where the new recruits appear, were considered a proxy for recruitment. In the figure below taken from the Spanish report, plots relating to recruitment at different levels of spawner abundance are presented.

STECF notes that these relationships would need to be investigated further, but they could be useful as predictors of sandeel abundance and could be used as a basis for management decisions, i.e. for fixing the quotas for the next year or for changing the date of opening of the next fishing season.

3) the characteristics of the fisheries in which the stocks are caught;

STECF notes that the current characteristics of the fishery (i.e. description of the gear, activity calendar, fishing areas, changes in target species along the year, landings by species, etc) are described in detail in the MP. The small size of the target species necessitates the use of a very small mesh size in the codend. Moreover, as the resources exploited with this gear inhabit areas very close to the shore, most of the fishing activity is concentrated within 3nm from the shore. STECF notes that although the fishing methods and the electronic devices limit unwanted catches, some by-catch remains in the catches especially for the few vessels targeting gobies fish.

STECF notes that the number of authorized boats in the Sonsera fishery remains fixed at 26, although not all vessels have been in operation in the recent years. Only these vessels able to demonstrate that they traditionally operated with Sonsera when the MP was implemented were granted an authorization. The beginning and end of the fishing season, the periods of seasonal closure, the number of days they are authorized to fish, the allowed landings per day and the number of hours of daily operations, are well defined in the MP. STECF notes that the MP prohibits the boats with a Sonsera licence to simultaneously fish with other gears. This measure avoids any increase in fishing effort on other resources exploited by the artisanal fleets along the Catalan coast.

4) the economic impact of the measures on the fisheries concerned.

STECF notes that the economic impact of the fishery activity and of the implementation of the new management measures was well analysed in the MP approved in 2014, but no new material was provided in 2017.
In terms of the socio-economic importance of the fishery, in 2012 the landings of the Sonsera target species represented 30.9% of the landings and 11.6 % of the revenue of the whole small-scale fisheries in Catalonia. About 97% of revenues of the catches under this fishing activity come from sandeel catches and only 3% from gobies on average. No information is provided on the actual social importance of this artisanal fishery.

The implementation of the MP has had an impact on socio-economic effects of the Sonsera and other artisanal fisheries due to the limitation of vessels involved, the reduction of effort on other species exploited by the artisanal small-scale fisheries, the setting of annual quotas according to resource availability, the settings of daily catch quotas per boat, concentration of the entire market in the authorized auctions, etc.

The report also considers that a prohibition of the Sonsera fishery could trigger a shift of fleet effort to other artisanal fishing activities. Information on the activities performed by the vessels who did not participate in the fishery in 2016 because of low catch rates would have been useful to assess this impact.

STECF is asked to evaluate data and information provided by Spain to assess whether the following conditions set out in the Mediterranean Regulation are still met:

5) There are particular geographical constraints, such as the limited size of coastal platforms or limited fishing grounds;

The species exploited by the Sonsera fishery almost exclusively inhabit shallow waters, mostly within 3nm from the coast. The boats involved in this fishery are required to operate within the 3nm when targeting G. cicerellus and the transparent goby A. minuta. Sandeel species live on sandy habitats along the Catalan coast over a limited depth range and are fished usually at depths between 6 and 16 metres. The gobies species are located over muddy-sandy bottoms. A. minuta is mainly exploited in depths between 7 and 12 meters in the Southern fishing grounds while C. linearis inhabits a deeper range between 30-50 meters and it is mainly distributed towards Northern Catalonia.

Therefore, this condition in the MedReg is still met.

6) The fisheries have no significant impact on the marine environment;

STECF notes that the information provided confirmed that the whole fleet has complied with the limitations imposed in the MP regarding the prohibition of fishing over Posidonia beds. The characteristics of the gear used suggest a relatively low mechanical impact on the ground as the net is relatively light and has limited contact with the bottom during the fishing operations. Vessels do not steam when the net is hauled, and the net does not drag on the bottom. There are however no experimental studies on the impact of the gear on the sea floor

The same fishing procedures and area limitations are proposed to be maintained in the new MP after its implementation.

Considering that sandeels may be important components of food webs in Mediterranean coastal waters as they are in the North Atlantic, the poor situation of sandeel stocks in Catalan waters may impact the status of coastal top fish predators feeding on them, which may in turn impact other small scale fisheries.

Therefore, this condition in the MedReg is still met.

7)The fisheries involve a limited number of vessels, with a track record of more than 5 years, and do not contain any increase in the fishing effort;

The maximum number of authorized boats seiners using Sonsera is 26. Such limit is included in the MP. The authorised vessels had to demonstrate that they operated with such gear in the last five years. All the proposed rules for daily activity, authorized days for operating, start and end of the fishing season, seasonal fishing bans, etc, remain unchanged.

At the time of the submission of the 2017 report on fishing under the MP, due to the substantial reduction of the availability of the resources and low catch limits set, 10 of the 26 vessels licenced boats of the Sonsera fishery were not active in that fishery. It is not know if they left the fishery or moved to other activities.
STECF notes that some vessels substitution seems to have occurred (SC 9 September 2014) and that the new vessels have the same technical characteristics but not necessarily the track record of 5 years compared to the other vessels. In such cases, this condition in the MedReg would not be fully met.

8) The fisheries cannot be undertaken with another gear;

The capture of sandeels and gobies that constitute the targets of the Sonsera fisheries cannot be legally undertaken with any other gear. The MedReg allows the continuation of such traditional fishing activity only under particular conditions. Authorization needs of the acceptance of derogations regarding mesh size and distance from the coast. This does not mean that these

species could not be actually caught with alternative methods. There are examples for instance in Italy of fisheries using bottom trawl nets in the past to capture A. minuta. They used a fine-meshed cover in the codend. Such nets were banned as they are not selective and by-catch includes high quantities of other fish, particularly juveniles of valuable species, many of them included in the Annex III of the MEDREG.

Therefore, this condition of the MedReg is still met, as the fish cannot legally be caught by other gears.

9) The fisheries are subject to a management plan and carry out a monitoring of catches as requested in Article 23

STECF notes that the fisheries are subject to a MP. A Co-Management Committee composed by representatives of the industry, scientists, representatives of NGOs and of the fisheries administration of the Autonomous Government and the Central Government has the function of managing the fishing activities.

This Co-Management Committee is responsible to monitor the sustainability and profitability of the fishery by implementing effort limitations in number of authorised boats, fleet activity and fixing annual catch limits. It has also the responsibility of revising every year the TAC levels based on the results of the previous fishing season and to impose new TACs as necessary at the start of the following fishing season.

The Committee also coordinates the scientific monitoring and the assessment of the compliance with the enforced management measures, and also suggests appropriate sanctions in case of non-compliance. It defines the time schedule and places where samplings will be conducted, both on board boat seiners and upon arrival of vessels to port.

The Committee also organizes regular inspections at the sea, at the port, at the fish auctions, at the fish wholesale and retail market, as well as the checking of all the landings based on the documents where daily catches are recorded.

Therefore, this condition of the MedReg is still met.

10) The fisheries do not operate above the seagrass beds of, in particular, Posidonia oceanica or other marine phanerogams; In the event that the fisheries operate above seagrass beds, the purse-line, the lead-line or the hauling ropes do not touch the seagrass beds.

The operations with Sonsera over Posidonia beds or above other phanerogams are prohibited by the Catalan government. Control of this measure is facilitated by the fact that boats operate very close to the shore. STECF notes that fishers are keen to avoid fishing over seagrass beds because the Sonsera needs clean bottoms for operating effectively. In fact, the presence of Posidonia leaves or rhizomes retained in the codend may produce important damages on the small and fragile target species, reducing the quality and value of the product. Moreover, cleaning operations in the case Posidonia is mixed with fish requires an enormous quantity of time.

STECF notes that the Annex of the implementation report of the Sonsera MP includes many charts with fishing effort distribution that can be overlaid with charts of distribution of marine phanerogams.

STECF notes however that the provided charts of distribution of marine phanerogam distribution are from before 2010, and should thus be updated to reflect recent patterns in fishing activities.

STECF considers that this condition of the MedReg is still met, but recommends an updating of the information used.

11) The fisheries do not interfere with the activities of vessels using gears other than trawls, seines or similar towed nets;

The operation area of the Sonsera fishery can spatially overlap with those of other small-scale fisheries. However, the interactions between Sonsera boats and other vessels can be considered limited as there is no competition regarding target species. Moreover, the use of the Sonsera does not damage other gears set in the same area.

STECF notes that by-catch of Sonsera may include some species (i.e. sparids, red mullet) that constitute the target of trammel nets, gill nets or longlines. Nevertheless, the impact of the Sonsera fishery on the abundance of these resources can be considered very modest, given the small mean number of individuals caught per tow and the limited number of vessels involved in the Sonsera fishery. STECF also notices that the vessels authorised to use the Sonsera gear are not authorised to use any other gear nor to target other resources.

Therefore, this condition of the MedReg is still met.

12) The fisheries are regulated in order to ensure that catches of species mentioned in Annex III, with the exception of mollusc bivalves, are minimal;

By-catch in the fishery targeting sandeels is reported to be limited. In any case, some species included in Annex III of the Mediterranean Regulation are present in the catch composition lists.

The fraction of by-catch in weight in the sandeel fishery were low and similar to the previous years. The percentage in weight varied between 2 and 8 % over the study period (2014-2016). The main bycatch species was Scomber colias (higher values refers only to 2014), followed by Pagellus erythrinus and a non-commercial species Synodus saurus. Only part of the individuals' length frequency was under the minimum landing size. In terms of numbers, the main by-catch species with sizes under the MLS is Pagellus acarne with an average number of 5.6 individuals per haul for which recruitment occurs in late spring-summer, followed by Sardina pilchardus (4.7 individuals per haul) and Engraulis encrasicolus (3.3 individuals per haul).

The fisheries for gobies shows higher fractions of undesired bycatch species. Most of the individuals are juveniles living close to the shore. The by-catch species percentage in weight in A. minuta catches was 6.7%. More than 20 species were observed in the by-catch. Some of them are included in the Annex III of MedReg. Even though the number of individuals caught is low, the percentage expressed in weight is higher due to the larger individual weight of the non-target species. Diplodus annularis represented in weight 0.9%, P. acarne 0.7% and P. erythrinus 0.6 % of the total catches. Juveniles of anchovy represented 0.04% and horse mackerel was also present in a minor proportion. Catches of Mullus barbatus and S. pilchardus were negligible in the analysed period. The importance of the different by-catch species in the catch may change, mainly depending on recruitment time schedules and time overlapping of the recruitment with the Sonsera fishery.

The percentages in weight of the by-catch in the analysed fishing trips targeting Crystallogobius spp are much higher than for A. minuta, but new information is not available as only few vessels have targeted that species in the recent years. . 4-5 vessels targeted Crystallogobius in past seasons due to the imposed restrictions of sandeel captures. Crystallogobius fishery by-catch represented in the past about 66% of the total catch in weight. Spicara spp represented the 23% of the catch. Several other species included in the Annex III (P. erythinus, M. barbatus and Boops boops) were present in the catches but in limited number and each one represented on average 2-3 % of the total catch in weight.

As regards to the real impact of the fisheries using Sonsera on by-catch species, STECF also notes that a part of the by-catch might survive the catching process. Catch sorting is done quickly inside containers filled with marine water which may enable a high survival rate after the individuals are returned to the sea. Video documentation was provided previously showing an apparent good condition of individuals returned to the sea however, no specific studies on survival after release were performed.

STECF considers that more efforts should be carried out to avoid or reduce the capture of juveniles during the recruitment period.

Therefore, this condition of the MedReg is not fully met.

13) The fisheries do not target cephalopods.

Cephalopod catches by sonsera boats are limited. According to the MP report, they are negligible in the sandeel and A. minuta fishery. In the fishery for C. linearis, Octopus sp catch were 6% in weight and for the squid Loligo sp. less than 1%.

Sonsera vessels do thus not be considered to target cephalopods, and this condition of the MedReg is still met.

STECF is asked to evaluate data and information provided by Spain with the aim to assess whether the amendments proposed to the management plan, once it ends, are in line with the key requirements and objectives of the Mediterranean Regulation (1967/2006) and the CFP Regulation (1380/2013).

The presented MP is guided by principles of good governance, including decision-making based on the best available scientific evidence, the maximum possible involvement of stakeholders and a long-term perspective. The MP includes measures which go beyond the provisions of the MedReg. Moreover, it proposes new studies for finding ways for reduction of discards and fixed strong limitations in the fishing effort, especially in periods of reduced availability of the resources.

STECF considers however, that the presented MP does is not fully in line with the objectives of the CFP, as the main stock is in poor condition and does not seem to be exploited sustainably.

The first amendment of applying the target threshold by vessel will incentivise an increase in fishing intensity and fishing efficiency, in order to maintain high catches and avoid cuts even at low stock biomass. Additionally, since only the most efficient vessels might remain in the fishery, their catch rates would not be directly comparable anymore with the historic baseline for TAC thresholds defined on a larger and less efficient group of vessels. The baseline would been to be defined for each vessel, in order to account for individual differences in efficiency. Alternative TAC rules might also be explored in an ITQ (Individual Transferable Quotas) context.

The second amendment would also distort the comparability of present catch rates with the historical TAC baseline, by allowing the most efficient vessels to fish more and thus increase the fleet's average catch rate.

Regarding the third amendment about transhipment, STECF considers that the main ecological impact lays in whether transhipped catches are reported and monitored in the same way as the rest of the catches. This is necessary to maintain the full overview of the impact of the fishing activity.

STECF conclusions

STECF concludes that the plan contains a lot of elements for the monitoring and management of activities of the Sonsera fishery, demonstrating positive achievements in the implementation of the co-managed plan for this small-scale fishery involving fishers, administration, NGOs and scientists.

STECF concludes also that most of the conditions for granting the derogations from MedReg regarding distance from shore and mesh size are met.

However, STECF notes that the decline of sandeel catch together with the predominance of recruits in the catches indicate that the stocks are in poor condition and not exploited sustainably,

which is confirmed by the results of an exploratory assessment. This might be further aggravated by poor environmental conditions and reduced productivity of the sandeel stocks. The TAC rules should be re-evaluated, and alternative management and recovery scenarios investigated and implemented to achieve a sustainable exploitation of the resources, accounting for changes in the size distribution of the catches and taking into account the socio-economic impacts. STECF encourages also undertaking scientific surveys in the area, allowing for a fishery-independent abundance index.

STECF expresses concerns on the proposed amendments, which bear a risk of incentivising the search of maintaining high catches even at low biomass and which would bias the comparability of current catch rates with the TAC baseline currently used in the MP. Such amendments would thus need to reconsider the TAC baseline in an ITQ context.

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[1] - Information on STECF members' affiliations is displayed for information only. In any case, Members of the STECF shall act independently. In the context of the STECF work, the committee members do not represent the institutions/bodies they are affiliated to in their daily jobs. STECF members also declare at each meeting of the STECF and of its Expert Working Groups any specific interest which might be considered prejudicial to their independence in relation to specific items on the agenda. These declarations are displayed on the public meeting's website if experts explicitly authorized the JRC to do so in accordance with EU legislation on the protection of personnel data. For more information: http://stecf.jrc.ec.europa.eu/adm-declarations

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Annex I – Background documentation - MANAGEMENT PLAN FOR THE SONSERA (BOAT SEINE) FISHERY - Report after three years of implementation - EN

Generalitat de Catalunya
Department of Agriculture,
Livestock, Fisheries and Food
Directorate-General for Fisheries and Maritime Affairs

MANAGEMENT PLAN FOR THE *SONSERA* (BOAT SEINE) FISHERY

Report after three years of implementation

Barcelona, October 2017

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REPORT ON THE STATUS OF THE MANAGEMENT PLAN FOR THE *SONSERA* FISHERY AT THE END OF ITS THIRD YEAR OF IMPLEMENTATION

1. Introduction

On 28 March 2014, Order AAM/87/2014 of 20 March 2014 adopting the Management Plan for the *Sonsera* Fishery on the Catalan Coast (2014-2019) entered into force. The Plan had received the European Commission's approval on 20 February 2014.

Article 1 of the Order establishes a five-year period of validity for the Plan, with the proviso that it be reviewed at the end of the third year. We consider that the peculiarity of the management model used in this Plan makes it unnecessary to amend the basic technical measures established in the regulation where the Management Plan is published. The adaptability and real-time management offered by the co-management model have enabled the resolution of all the issues that have arisen during the first three years of the Plan's implementation, which would have been difficult with a conventional management model. Since the beginning of the preliminary study, the resource's circumstances have changed drastically. The great abundance of the resource during the Management Plan's design phase and its first year of implementation led to community management of the fishery, which was forced to temporarily close from 2015 until April 2016 due to the drop in catches.

During 2017, the Standing Committee (SC), with the approval of the Joint Management Committee Plenary and based on the idea of adaptive management that goes hand-in-hand with co-management, has reconsidered the implementation of the community management model based on vessel associations, dissolving them and permitting vessels that have not reached the established quotas to temporarily abandon the *sonsera* fishery and return to the basic small gear method. The details and timeline of the fishery's evolution over the first three years of the Management Plan's implementation will be described throughout this report.

2. Brief history of the co-management model

On 26 April 2012, the Management Plan for the *Sonsera* Fishery's Joint Management Committee (MPSJMC) was established at the headquarters of the Directorate-General for Fisheries and Maritime Affairs. The Joint Management Committee is made up of representatives of the fisheries sector, scientists from the Marine Sciences Institute of the Scientific Research Council (ICM-CSIC), representatives of the environmental non-governmental organisations World Wildlife Fund (WWF) and Greenpeace, as well as members of the fisheries administrations of the Government of the Autonomous Community of Catalonia and of the Spanish Government (the national fisheries administration joined the Committee on 14 December 2012).

The MPSJMC's main functions include managing fishing activity according to the criteria established in the MPS, proposing and coordinating the scientific studies, participating in monitoring compliance with the management measures planned and proposing the necessary adaptive measures in the event of non-compliance. The MPSJMC's functions also include presenting proposals to the European Commission (EC) and informing it, through the relevant administration, about aspects relating to the Management Plan and its possible amendments.

In June 2012, on the basis of the provisions of Article 7 of Council Regulation (EC) No 1224/2009 of 20 November 2009 establishing a Community control system for ensuring compliance with the rules of the common fisheries policy and Article 1(2) of Council Regulation (EC) No 1967/2006 of 21 December 2006 concerning fishing in the Mediterranean Sea, the Catalan Directorate-General for Fisheries and Maritime Affairs authorised fishing with the *sonsera* gear for 10 of the 25 vessels proposed in the MPS, with the goal of obtaining the necessary data for the scientific study required. This first phase of data collection was carried out following the measures provided for in the MPS project and with supervision and monitoring from the MPSJMC.

In August 2012, in the framework of a contract with the ICM-CSIC, which was initially funded by the *sonsera* sector, complementary sampling commenced for the analysis of data provided daily by the authorised vessels on target and non-target species landings.

Within the MPSJMC, a working body was set up: the Standing Committee (SC). It meets monthly with the goal of monitoring and controlling the activity.
On 12 February 2013, a double meeting was held in Barcelona with two members of the European Commission's DG MARE attending as invited observers. The main goal of this special meeting of the Joint Management Committee Plenary was to present the Committee's operation to the DG MARE specialists. As explained at the meeting, there is a series of principles related to the co-management model which are still valid today:

I. The sector is actively involved in co-managing the *sonsera* fishery, including, among many other elements, participating in funding the scientific study.

II. The scientific study and the monthly landings assessment, which aim to identify the population's status, facilitate decision-making around setting the quotas per vessel per day and around the need to proceed to the temporary closure of the fishery.

III. The feeling among the fisheries sector and among the Committee members is that they are launching a new fisheries management model based on co-management and co-responsibility, which in all likelihood will be exportable to other fisheries. As expressed by the NGOs, co-management in a way calls to mind the old self-regulation systems of small-scale fishermen, which were so effective and which disappeared with the emergence of industrial fisheries.

After this informative meeting and up until the entry into force of the current Management Plan, the Joint Management Committee's activity, especially through its Standing Committee, involved assessing and proposing technical management measures that would shape the final Plan approved via Order AAM/87/2014 of 20 March 2015 adopting the Management Plan for the S*onsera* Fishery on the Catalan Coast (2014-2019), which **would enter into force on 28 March 2014**. The adoption of the Order in accordance with the technical measures agreed with the EC and its Scientific, Technical and Economic Committee for Fisheries (STECF) allowed for the publication of Commission Implementing Regulation (EU) No 464/2014 of 6 May 2014 derogating from Council Regulation (EC) No 1967/2006 as regards the minimum distance from the coast and the minimum sea depth for boat seines fishing for sand eel (*Gymnammodytes cicerelus* and *G. semisquamatus*) and gobies (*Aphia minuta* and *Crystalogobius linearis*) in certain territorial waters of Spain

(Catalonia).

3. Implementation of the Management Plan. Joint Management Committee sessions. Summary of agreements made and debates held

On 28 March 2014, Order AAM/87/2014 of 20 March 2014 adopting the Management Plan for the *Sonsera* Fishery on the Catalan Coast (2014-2019) entered into force. Since that date, the Order has been the legal reference for the Joint Management Committee's implementation of the Management Plan's technical measures.

The monitoring sessions and meetings held by the SC and the Plenary and the main agreements reached and management measures implemented are presented below:

SC monitoring session of 11 April 2014

This was a special session where the main authorities of the Catalan and Spanish fisheries administrations presented the Order for the Management Plan. Before addressing the items on the SC monitoring sessions' regular agenda, the Minister of the Department of Agriculture, Livestock, and Fisheries of the Catalan Government, Josep Maria Pelegrí, presented the reasons for his presence and that of the rest of the invited guests at the special SC session. The Director-General for National Fisheries Management, Andrés Hermida, also dedicated some words to the co-management model's excellence, especially with regard to sustainable resource management, and he mentioned environmental, economic and social sustainability.

The President of WWF International, Yolanda Kakabadse, ended the presentation by praising the co-management model, which she would like to extend to other fisheries around the world. She spoke about the importance of fishing on a global level and how without this activity food security would not be possible.

Next, the monitoring session's standard protocol was initiated, addressing the following points:

1- CONTROL PANEL

a. *Review of goby* (llengüeta) *catches in March*

b. *Review of sand eel* (sonso) *catches in March*

c. *Summary of actions relating to fisheries inspection and the traceability of the* sonsera *fishery catches and of the target species catches (port/at-sea inspections, Mercabarna fish market, etc.)*

2 - All *sonsera* fishery management issues proposed by the SC secretary or at the request of any of its members.

Meeting of 12 May 2014 between SC representatives and the national fisheries administration

The following pending issues were addressed:

- Member State decision authorising derogation from the minimum mesh rules for towed

nets provided for in Council Regulation (EC) No 1967/2006 of 21 December 2006. The *sonsera* is equipped with a cod-end mesh greater than or equal to 2 mm.

- Publication of the Order equivalent to the autonomous-level Order adopting the Management Plan for the *Sonsera* in external waters.

- Defining the future of the Management Plan for the *Sonsera* Fishery's Joint Management Committee (MPSJMC). At the time, a draft was being prepared for an agreement to regulate the structure and distribution of responsibilities of the new *Sonsera* Fishery Joint Management Committee (SJMC), which would replace the one operating during the preparation of the Management Plan.

- The Management Plan for the *Sonsera* Fishery rests on two pillars that must be maintained under all circumstances:

  a) **The sector's co-responsibility:** There is a series of measures that should be taken on by the sector itself, such as the organisation of the work schedule, the quotas per vessel and the ways to compensate for potential overfishing. This should be respected by the sector and not require intervention from the administration, nor the publication of provisions in administrative decisions.

  b) **Immediacy and agility** in the implementation of the management measures that, in accordance with the Order adopting the Plan, can be adopted via an administrative decision from the director-general for Fisheries:

     - Quota reduction based on scientific advice;
     - Annual renewal of the special *sonsera* fishing permits;
     - Approval of the possible provisional measures for withdrawing the special permit due to serious violations;
     - Closure of the fishery in the event of not reaching the safety threshold for catches;
     - Vessel associations to share quotas (reducing live discards caused by exceeding the daily quota);
     - Reduction of the season's duration on the basis of scientific advice (the Plan requires scientific monitoring that was initially funded by the *sonsera* fishermen);
     - Changes to ports of landing;
     - Establishment and modification of the mechanisms for communication between the sector and the Joint Management Committee;
     - Other

- Establishment of a legal mechanism allowing the transhipment of small quantities of live sand eel at sea to bottom longliners. It was noted that the original purpose of the *sonsera* fishery had been to capture bait for bottom longliners. The Control Regulation created serious difficulties for transhipment. It had to be taken into account that these were live fish, intended for live bait.

SC monitoring session of 14 May 2014

Ordinary SC session addressing the control panel as well as the following important points:

- Entry into force of Commission Implementing Regulation (EU) No 464/2014 of 6 May 2014 derogating from Council Regulation (EC) No 1967/2006 as regards the minimum distance from the coast and the minimum sea depth for boat seines fishing for sand eel (*Gymnammodytes cicerelus* and *G. semisquamatus*) and gobies (*Aphia minuta* and *Crystalogobius linearis*) in certain territorial waters of Spain (Catalonia).

- Start of the sand eel fishing season in the framework of the Management Plan approved via Order AAM/87/2014 of 20 March 2014 adopting the Management Plan for the *Sonsera* Fishery on the Catalan Coast.

- Transhipment of live sand eel at sea as bait for bottom longliners. Possibility of derogation from the Control Regulation's prohibition.

- The sector proposed debating and accepting a 500 kg quota per vessel per day for the month of June for vessels with three or more crew members and a 379 kg quota per vessel per day for vessels with up to two crew members.

SC monitoring session of 10 June 2014

Ordinary SC session addressing the control panel and some other minor issues. The issue of transhipment of sand eel for live bait, requests from new vessels to join the census, home port changes, etc. were studied.

SC monitoring session of 15 July 2014

Ordinary SC session. This session addressed the control panel and some very important aspects for the future of the Management Plan. The content of the administrative appeals presented against the Order adopting the Management Plan was discussed. Fundamentally, the appeals were directed against the Plan's closed fleet census and the inability of new vessels to join the census. This was conditioned by the need for a minimum five-year track record in the fishery provided for in Council Regulation (EC) No 1967/2006 of 21 December 2006. The appellants did not agree with that restriction and requested challenging the Order.

- Reading of the appeal presented by the Spanish National Union of Maritime Cooperatives (UNACOMAR) to the Minister of the Department of Agriculture, Livestock, Fisheries, Food and the Environment in relation to the publication of Order AAM/87/2014 of 20 March 2014 adopting the Management Plan for the *Sonsera* Fishery on the Catalan Coast.
- Reading of the report prepared by the Directorate-General for Fisheries and Maritime Affairs.
- Reading of the administrative appeal presented by the San Telmo Fishermen's Association in Arenys de Mar against the Order adopting the Management Plan.
- Reading of the report prepared by the Directorate-General for Fisheries and Maritime Affairs at the request of the Legal Services of the Department of Agriculture, Livestock, Fisheries, Food and the Environment asking the High Court of Justice of Catalonia not to apply the precautionary measure suspending the Order requested by the appellant.
- Reading of the report presented by lawyer Francisco Sánchez Muñoz on behalf of a group of small-scale vessel owners in relation to the administrative appeal presented by

him against Order AAM/87/2014 of 20 March 2014.
- Proposal to reform certain points of the Order adopting the Management Plan for the *Sonsera* Fishery.
- Administrative decision on granting special permits and other requirements present in Order AAM/87/2014 of 20 March 2014.
- Draft of the agreement creating the *Sonsera* Fishery Joint Management Committee.
- Processing status of the Order on external waters.
- Processing status of the possibility for transhipment of live sand eel at sea.
- Request for new vessels to join the census

SC monitoring session of 9 September 2014

Ordinary SC session addressing the control panel as well as routine issues.
The issue of substituting one of the vessels on the census was discussed as a point of special interest. *El Bolerico* was replaced by the vessel *Sol Ixent IV* (3a BA-1 3-97). The Order adopting the Management Plan for the *Sonsera* Fishery provides for the option of substituting vessels on the census as long as the new vessels fulfil the technical conditions and do not exceed 10 m in total length or 75 kW (100.57 hp) in engine power.

SC monitoring session of 14 October 2014

Ordinary SC session addressing the control panel as well as routine issues.
A new administrative appeal presented by a group of small-scale vessel owners from Badalona was discussed as a point of special interest. The treatment of the appeal by the Legal Services of the Department of Agriculture was the same as in previous cases when, as an interim measure, the provisional inclusion of the shipowners from Badalona in the specific census was requested. The reports had already been assessed by the Standing Committee.

SC monitoring session of 13 November 2014

Ordinary SC session addressing the control panel as well as routine management issues.

SC monitoring session of 9 December 2014

Ordinary SC session addressing the control panel as well as routine management issues.
The end of the sand eel season on 15 December and the debate about the conditions for starting the goby (*Aphia minuta* and *Crystalogobius linearis*) season were dealt with as issues of special importance.

SC monitoring session of 27 January 2015

Ordinary SC session addressing the control panel as well as routine management issues, which in this case only affected the goby since the sand eel season was closed. The following issues of special relevance were addressed:

- Request from the boat *Elisa* made by telephone and through the representative of the *sonsera* sector in Girona to join the sand eel fishery from the start of the season. This vessel, despite forming part of the Management Plan's census, had not participated in

the fishery since the Plan's adoption.

- Invitation to members of the MPSJMC to attend the presentation of the Committee's experience in the context of creating a management plan for the Strunjan Nature Reserve, the largest marine protected area in Slovenia. WWF would attend, as would Mauricio Pulido, as representative of the sector in the Joint Management Committee's Standing Committee.
- Trip to Portugal: Catalan visit to Peniche (Portugal) on 11 and 12 February, where co-management topics such as the *sonsera* and the Palamós shrimp fisheries would also be discussed. Rita Sá, WWF representative in Portugal, commented that this was a European co-funded project that wanted to learn about Catalonia's experience in co-management. At the time, they were still evaluating the fishery to which co-management could be applied.
- Workshop in Barcelona marking the end of the European project GAP2. On 24, 25 and 26 February. The workshop would also be attended by a representative of the Portuguese Government. Moreover, over 100 people from different countries were expected to attend and aspects related to co-management, mainly in the Mediterranean, would be discussed: The Sand eel, Palamós shrimp and Roses hake fisheries.
- WWF participation in managing the Balearic Islands' transparent goby (*jonquillo*) fishery (boat seine practice similar to the *sonsera*). WWF wanted to join management of the Balearic Islands' transparent goby fishery through the committee formed by the administration and the fishermen. On 9 February, WWF would participate in the meetings for the first time and after this date it was expected to attend regularly.

SC monitoring session of 19 February 2015

Ordinary SC session addressing the control panel as well as routine management issues. The following items can be highlighted:

- Start of the sand eel season on 1 March: During the first and last two weeks of the season, all of the vessels that had a special fishing permit would be able to go out fishing. The initial quotas would be 100 kg per vessel per day for vessels with two crew members and 133 kg per vessel per day for vessels with more than two crew members.
- Of the 26 vessels on the census of the Management Plan for the *sonsera* fishery, two had not yet participated in the fishery because they had used their vessels for other modes of fishing. The vessels *Marlu* (3a BA-4 1-93) and *Elisa* (3a BA-2 3754) had asked to join the activity on 1 March and therefore requested being granted the special permit for fishing with the *sonsera*.
- The owners of the vessel *Bolerico* (3a CP-1 1-96) had requested a change in the census to *El Bolerico II* (3a BA- 1 3-97) (previously *Sol Ixent IV*).

Combined session of 17 March 2015

During this session, three different meetings were held.

º 12.00: Plenary session
º 15.30: SC monitoring session
º 17.00: Meeting with the *sonsera* fishermen's collective and representatives of the fisheries sector.

Plenary session: The SC brought the Plenary members up to date on the informative meetings and sessions that had been held, and on activities relating to inspections and penalties. A brief summary was provided on the evolution of the scientific monitoring process: evaluation of the relationship (proportion) between the theoretical catches and the actual catches made; length/weight distinction between the Mediterranean sand eel (*Gymnammodytes cicerelus*) and the smooth sand eel (*Gymnammodytes semisquamatus*); size differences between the 2013 and 2014 seasons; stage of maturity of females and males; calculation of the CPUE; etc.

Monitoring session: The issues discussed included the assessment of the goby season and the continuity of vessels, schedule planning for sand eel and goby vessels, and maximum quotas per vessel in the coming days.
The session's main theme revolved around the sector having noticed the **practical disappearance of sand eel catches during the beginning of the season** and the special measures that would probably be required. The previous week, the fishery had been closed for one week at the sector's request due to lack of catches.

In the end, a maximum quota of 100 kg per vessel per day, working every other week as per the schedule, was established.

Meeting with fishermen from the *sonsera* fishery: The *sonsera* fishery sector was informed about the issues that had been addressed in the morning's Plenary session.

SC monitoring session of 22 April 2015

Ordinary SC session addressing the control panel as well as routine management issues. The following items can be highlighted:

- Processing status of the draft Order for the Management Plan for the *Sonsera* in external waters. Presentation of the draft Order.
- Possibility of increasing the Management Plan's vessel census.

  March had been a very bad month for sand eel and the sector had been and still was very worried. However, at this point, the quota expected (just 100 kg per vessel per day) was being reached.

  SC monitoring session of 19 May 2015

  Ordinary SC session addressing the control panel as well as routine management issues. The following items can be highlighted:

- Reduced daily quotas: At the time, most of the fleet could reach the quotas without too much difficulty. The sector had planned to propose increasing the quota to 150 kg/day. However, the increase in profits would have been very limited and perhaps some vessels would not have been able to reach the new quota. It was decided to maintain the 100 kg quota.

- According to information from different witnesses, one of the census vessels had caught a school of greater amberjack (*Seriola dumerili*), a species that the *sonsera* is not

authorised to catch. Through the sector representatives, the secretary would investigate the truth, or lack thereof, of the facts reported.

- In the context of a new dredging project in the area of Arenys de Mar, it was agreed to prepare a document addressed to the Ministry of Agriculture, Fisheries, Food and the Environment requesting the creation of a multidisciplinary technical group made up of members of the Committee, other representatives from the fisheries sector and representatives from the coastal authority, the local administrations and the concession holder.

SC monitoring session of 17 June 2015

Ordinary SC session addressing the control panel as well as routine management issues. The following items can be highlighted:

- After verifying the facts about the vessel responsible for catching greater amberjack (discussed in the previous monitoring session), the SC had summoned the owners of the two vessels involved in the events. After asking the attendees and having heard the explanations and justifications, the SC debated and agreed to impose a penalty on the vessel within the framework of its functions. It temporarily withdrew (for one month) the vessel's special permit for the *sonsera* fishery, requiring it to work with the basic small gear method it was authorised for.

- The vessel *Lluerna* presented its report on the excavation site, the area covered and the disposal site of the dredger that had been hired for the regeneration of beaches on the Maresme coast. A meeting had been planned to take place at the Sub-Directorate General for Coastal Protection. It was agreed to prepare a list of participants including a representative from the ICM-CSIC, a WWF representative, a representative from the Barcelona fisheries sector, a representative from the *sonsera* fisheries sector of Barcelona and a representative from the Directorate-General for Fisheries and Maritime Affairs.

- The WWF representative informed the SC that a meeting/workshop would be held in Barcelona on 12 and 13 September 2015 with other Autonomous Communities (Balearic Islands and Murcia) with management plans for boat seines. This meeting had been proposed in previous sessions by WWF, which would also organise the event. The representatives on the *sonsera* Standing Committee would attend the meeting.

SC special session of 6 July 2015

Special session called at the request of the representatives of the *sonsera* fishery sector in view of the special measures that could be adopted to close the fishery due to the drop in catches in the last month.

The first speaker was the *sonsera* representative from Girona, who maintained that despite the fact that June's catches had been good in relation to the targets, the last week of June and the first week of July had been very bad and sand eel had practically disappeared. According to the first sale notes, during the month of June, 88 % of the quotas had been reached on the days when sales had been made. With regard to the full quota available, only

64.9 % of the potential had been reached. In accordance with Article 6(6) of the Management Plan Order, this situation demanded reducing the quota by half. It was agreed to apply a quota of 250 kg per week (50 kg per boat and day), working every other week as per the schedule, with a maximum of 100 kg per boat and day.

At midday on Friday 17 July, the two previous weeks' catches would be evaluated and the quota percentage reached would be assessed. On the basis of these data and pursuant to the provisions of the Management Plan, either the situation would remain the same for two more weeks or the fishery would be closed. The possibility of further reducing the quota to half of the then current 50 kg per boat per day was not considered.

It was agreed that in the event of having to close the fishery in compliance with the provisions of Article 6(6) of Order AAM/87/2014 of 20 March 2014, the special fishing permits would remain valid and the vessels would not be able to work in any other small gear fishing activity. In the event that a vessel requested withdrawal of the special permit in order to be able to work in different fishing activities, each case would be assessed individually and the conditions for the withdrawal and renewal of this special permit would be agreed.

Given the significance of the fishery's closure and the repercussions it could have on the rest of the fisheries sector, it was agreed to send a copy of these meeting minutes to the Director-General of Fisheries and Maritime Affairs, in case she considered it appropriate to send them on to the Joint Management Committee Plenary.

- WWF informed that the General Fisheries Commission for the Mediterranean (GFCM) would hold its second conference on small gear fisheries in the Mediterranean in Algeria between 7 and 10 March and that the *sonsera* co-management model would once again be on the table.

- WWF commented that the meeting with boat seine fishery committees from the Balearic Islands and Murcia was planned for Saturday 12 September. It noted that perhaps it was not a good date since it would coincide with a long weekend and with the day after the National Day of Catalonia. It would be assessed whether to stick to that date or not.

<u>SC monitoring session of 8 September 2015</u>

Session assessing the closure of the fishery initiated on 17 July 2015, with the following considerations:

- The **temporary closure of the *sonsera* fishery starting at 00.00 on 20 July 2015 and continuing until 15 December 2015** was discussed.
- In accordance with the provisions of Article 10(3) of Order AAM/87/2014 of 20 March 2014 adopting the Management Plan for the *Sonsera* Fishery on the Catalan Coast, the vessels would not be able to work in any other fishing or shellfish activity during the closure.
- Given the situation of *force majeure* caused by the practical disappearance of sand eel catches (an unheard-of situation since scientific monitoring of the fishery began), continued sampling would be carried out as part of the Management Plan's monitoring process. Vessels registered in both maritime provinces would participate. It would not be

permitted to land or sell the samples caught, except those that were going to be used for scientific analysis in the ICM-CSIC laboratories in Barcelona.

SC monitoring session of 22 October 2015

The fishery remained closed. The following issues were addressed:

- The different options for *sonsera* fishery vessels to be able to survive financially during the two and a half months of the sand eel closed season (once the unemployment benefit period ended) were discussed. Following the request from the last Standing Committee meeting about the possibility of the *sonsera* fishery receiving funding due to its closed seasons, the Sectoral Committee agreement included the option for Catalonia to request aid (for the sand eel fishery alone) in response to the fishery's temporary closures; this request would take place within the framework of the European Maritime and Fisheries Fund (EMFF) and according to the agreements of the Ministry of Agriculture, Fisheries, Food and the Environment's Sectoral Conference on Fisheries.
- In relation to the sudden disappearance of the sand eel, the ICM-CSIC representative commented that, despite the Joint Management Committee's efforts, it was not possible to control 100 % of the sand eel population. There were many uncertainties such as, for example, the hypothesis that the increase in water temperature that year had greatly affected recruitment. He commented on the option of taking out insurance for emergencies such as the then current one. Among those present, it was remarked that there were insurance companies, but that the premiums were very high when there was so little data.
- Marie-Emile Guélé, WWF observer at the session, introduced herself and spoke about collaborating with Susana Sainz-Trápaga to organise the WWF session at the next GFCM meeting, to be held in Algiers between 7 and 10 March 2016. Marie-Emile Guélé said that six co-management cases would be analysed:

    - Two cases of co-management linked to natural parks in Croatia;
    - One case of co-management in Algeria, also linked to natural parks;
    - The case of the *sonsera* fishery in Catalonia;
    - The case of MEDERNET, also in Catalonia;
    - One scientific article about co-managing natural parks.

She commented that four years of co-management experience had allowed the Joint Management Committee to detect all kinds of problems and learn how to move forward during both good times and bad. She also said that she hoped the GFCM would adopt this management method across the Mediterranean.

SC monitoring session of 24 November 2015

The fishery remained closed. Several issues regarding management of the *sonsera* fleet and licences were addressed, but the main topic was the meeting of the Sectoral Committee for Fisheries, to be held the following Thursday 19 November 2015 *[sic]* in Madrid, where the issue of closed seasons and possible aid from the EMFF would be discussed.

SC monitoring session of 19 January 2016

It was closed season for sand eel. The following issues were addressed:

- The goby season had started normally. Only two vessels fished: the *Trasmallero* and the *Nuria*, which both catch *Aphia minuta*. There would be no *Crystallogobius* season that year, but it was commented that sampling should be carried out to check the species' abundance
- ICM-CSIC representatives commented that no sand eel had appeared in the last sampling carried out. Sampling and research on a large vessel had been planned for the following week in Blanes. Researchers would search for sand eel and *Crystallogobius*. The ICM-CSIC intended to search for sand eel in uncommon places; for example, at greater depth.
- The Algiers Regional Conference on sustainable small-scale fisheries was discussed. In order to avoid repeating how the MPSJMC works, this time it was agreed to focus participation on the management of the crisis caused by sand eel scarcity in 2015. The topic would be 'Managing a crisis'. The ICM-CSIC representative suggested that, as a conclusion to the conference, it could be interesting to request the GFCM to provide a recommendation supporting co-management in fisheries.

SC monitoring session of 23 February 2016

Ordinary SC session addressing the control panel (goby catches and inspection) as well as routine management issues. The following items can be highlighted:

- Given the proximity of the beginning of the sand eel season on 1 March, the ICM-CSIC representative informed the SC that with regard to the results of the sampling carried out on 22 February, there were two points of view:

a) Optimistic point of view: Sand eel had been found in Blanes and in Arenys de Mar, but not in Sant Feliu de Guíxols or in Palamós. A few kilos of very small specimens and some large ones still in the reproduction phase. The smooth sand eels were reproducing and there were more smooth sand eels than Mediterranean sand eels.

b) Pessimistic point of view: There was very little.

In the end, it was agreed that the ICM-CSIC representatives would release a report assessing the evolution of the sampling carried out since the sand eel fishery's closure in July 2015. The report would demonstrate that there were not enough signs to suggest that the sand eel would recover that year and, moreover, according to the most recent samplings at the time, laying had been delayed. For these reasons, they would recommend a postponement of the start of the fishing season, planned for 1 March according to the Management Plan. The sector representatives also considered that the start of the season had to be put back for the good of the Management Plan. During the following weeks, sampling would be carried out with multiple vessels to assess the evolution of the abundance and size of the sand eel. The SC proposed that the fishery remain closed. Until it could be reopened, unemployment benefits would be requested for crew members and owners at the Mariners' Social Institute (ISM).

SC monitoring session of 17 March 2016

Ordinary SC session addressing the control panel (goby catches and inspection) as well as routine management issues. The following items can be highlighted:

- The ICM-CSIC representative informed the session about the last sand eel sampling carried out. The situation had improved in comparison to the previous sampling. In Arenys de Mar, several small schools of around 5 kg had been detected and two samples had been taken; in Playa de Aro, a 100 kg school had been caught. Some large sand eels had been found, both Mediterranean and smooth sand eels, between 14 cm and 15 cm, and egg-laden. The small specimens caught (3-5 cm) were all smooth sand eel and the specimens between 6 cm and 12 cm were all Mediterranean sand eel. Recruitment had been detected. The sector representatives agreed that the situation had improved, but that there was still not enough abundance to reopen the fishery. The ICM-CSIC proposed sampling every 15 days and the sector proposed sampling with six to seven boats on 29 March with the aim of reopening the fishery on 4 April if the results of the sampling allowed for it. It was also commented that it would not be necessary for all of the boats to load the gear; schools could be detected with an echo sounder. However, it could not be guaranteed that the fish detected were sand eel without setting the gear. In the event that an increase in sand eel abundance were detected, a special session of the Standing Committee could be organised to decide on the possibility of and conditions for opening the fishery.

- The *sonsera* sector considered that some agreements were needed to define the conditions for accessing the small gear fleet and for re-entry into the *sonsera* fishery in the event that sand eel appeared at a later point. A mechanism and some conditions would also have to be established for part of the fleet to work in the *sonsera* fishery while the other part worked with the small gear fleet.

- One of the observers suggested that moving certain vessels to the Ebro Delta area, where the abundance of *Aphia minuta* was well known, could be authorised. The secretary reminded the observer that that area was outside of the Management Plan's scope of implementation and therefore of the derogation from the minimum cod-end mesh size, the minimum distance from the coast and the minimum depth; therefore, it could not be authorised.

<u>SC monitoring session of 14 April 2016</u>

Ordinary SC session addressing the control panel (goby catches and inspection) as well as routine management issues. The following items can be highlighted:

- Of the two vessels engaged in goby fishing, the *Trasmallero* had ended the goby season upon reaching half of the quota (900 kg). The *Nuria* would continue until reaching the full quota of 1 800 kg or until the end of the season on 30 April.

- The ICM-CSIC commented that many large sand eel schools had been found at the usual depth of eight metres. In terms of the size of the sand eels, they were from that year, therefore they were immature. The fishery would depend on recruitment that year. The sector believed that there would be no obstacles to ending the year's season with enough catches. **All participants agreed to reopen the fishery on Monday 18 April.** The sector voted and of 24 votes (two vessels do not vote because they fish for goby),

22 were in favour of reopening the fishery on 18 April.
The issue of the quota was debated and in the end a reduced quota of 80 kg was agreed for vessels with three or more crew members. For vessels with two crew members, the quota would be set based on the usual proportion and the result was 61 kg per vessel per day. The quotas would be reviewed by agreement of the Standing Committee on the basis of the abundance of sand eel and the sale prices at the auction market. Vessels would work every other week, as per the schedule. Of the 24 vessels, one group would fish during the week starting on 18 April and the other during the week starting on 25 April. From May, a work schedule would be established for the entire season for the 25 vessels that wanted to work with sand eel. The vessel *Trasmallero*, due to the large distance separating it from the sand eel fishing ground, had requested the withdrawal of its special *sonsera* fishery permit for the 2016 season.

- It was considered to be a good time to re-examine the option of carrying out acoustic research to evaluate the sand eel populations. WWF put forward a new acoustic monitoring offer.

SC technical session of 28 April 2016

Technical session where the scientific group informed the SC about the evolution of certain factors during the scientific monitoring process. Information was also provided on WWF's acoustic survey.

SC monitoring session of 24 May 2016

Ordinary SC session addressing the control panel as well as routine management issues. The following items can be highlighted:

- In accordance with the first sale notes data for *Aphia minuta*, of the 1 800 kg maximum quota established in the MPS, 1 433 kg had been landed.

- After several proposals aiming to improve the yield of the quotas and to avoid unnecessary sand eel death, it was agreed to establish a new method for distributing and calculating the daily quotas per vessel in the case of situations such as the then current one where there was a 'reduced quota'. The difficulty with adjusting landings to the tolerance percentages provided for in Article 7 of Order AAM/87/2014 of 20 March 2014 adopting the Management Plan in the case of reduced quotas (then 80 kg/vessel/day) had made it necessary to establish, via agreement, a method for distributing quotas that would resolve the issue while at the same time complying with the provisions of Article 7 of the Management Plan.

- The quota and the weekly distribution would be as follows:

a) Vessels with three or more crew members:
   - The maximum daily quota per vessel from Monday to Thursday would be 100 kg.
   - The maximum daily quota per vessel on Friday would be 80 kg.
   - A maximum weekly quota per vessel would be set at 400 kg.

The tolerances and compensations provided for in Article 7 of Order AAM/87/2014 of

20 March 2014 would be applied to the above daily quotas, as would the possibility of sharing quotas between associated vessels found in Article 8 of the same Order.
In the event that a vessel reached the maximum weekly quota of 400 kg in the first four days of the week, on Friday it would have to remain at port.
Daily excess catches of up to 10 % would be compensated for on the last day of the week to avoid exceeding the weekly maximum of 400 kg. In the event that excess catches of up 10 % were reached on the last working day of the week, exceeding the maximum weekly quota of 400 kg, this would be compensated for on the last working day of the following week.

b) Vessels with two crew members:
- The maximum daily quota per vessel from Monday to Thursday would be 76.25 kg.
- The maximum daily quota per vessel on Friday would be 61 kg.
- A maximum weekly quota per vessel would be set at 305 kg.

The tolerances and compensations provided for in Article 7 of Order AAM/87/2014 of 20 March 2014 would be applied to the above daily quotas, as would the possibility of sharing quotas between associated vessels found in Article 8 of the same Order.
In the event that a vessel reached the maximum weekly quota of 305 kg in the first four days of the week, on Friday it would have to remain at port.

Daily excess catches of up to 10 % would be compensated for on the last working day of the week to avoid exceeding the weekly maximum of 305 kg. In the event that excess catches of up to 10 % were reached on the last working day of the week, exceeding the maximum weekly quota of 305 kg, this would be compensated for on the last working day of the following week.
The quotas and the distribution method were developed in accordance with the provisions of point 4 of the Director-General for Fisheries and Maritime Affairs' Decision of 15 April 2016, granting special permits for sand eel fishing with *sonsera* for the 2016 season, and reflected the agreements made in the MPSJMC's Standing Committee monitoring session of 24 May 2016. The quotas and the distribution method would be applied from Monday 30 May 2016.

<u>SC monitoring session of 19 July 2016</u>

Ordinary SC session addressing the control panel as well as routine management issues. The following items can be highlighted:

- In summary, 93 % of the established quota had been reached. Some ports were 100 % successful. In general, any loss of quota was due to small vessels without much experience that did not usually reach the assigned quota.
- Given the abundance of sand eel and expecting prices to rise somewhat during the summer, the sector asked for a slight increase in the quota from 80 kg to 100 kg per vessel per day in the case of vessels with more than two crew members on board. For vessels with two crew members, the quota would increase from 61 kg in the same proportion.
  It was also requested that the management mechanism applicable to reduced quotas be used so that the weekly quota (500 kg for more than two crew members) could be distributed equally from Monday to Thursday (125 kg/day).

- Acoustic monitoring of the sand eel: That week, the boat would be moved to the port of Arenys de Mar for the acoustic study. They planned to carry out the first calibration tests during the following week starting on 25 July.
  First, the sensors would be calibrated with live sand eel caught by the *Esparta* vessel; they would be placed in a cage that would allow them to be buried in the sand. It was suggested that the Directorate-General for Fisheries and Maritime Affairs authorise the scientific activity with both vessels: one provided by the company, which would assemble the acoustic monitoring equipment; and the *Esparta*, which had a special permit for sand eel fishing with *sonsera* and was based in the port of Arenys de Mar.

SC monitoring session of 20 September 2016

Ordinary SC session addressing the control panel as well as routine management issues. There were no specific noteworthy items at this meeting.

SC monitoring session of 13 October 2016

Ordinary SC session addressing the control panel as well as routine management issues. The following items can be highlighted:

- Study on the use of genetics in the fishery management of two species with high commercial value: the Mediterranean sand eel (*Gymnammodytes cicerelus*) and the smooth sand eel (*Gymnammodytes semisquamatus*). The sector's collaboration was requested to provide samples to determine the existence of different populations.

SC monitoring session of 15 November 2016

Ordinary SC session addressing the control panel as well as routine management issues. The following items can be highlighted:

- Update of the Medfish project and next steps relating to the sand eel fishery. Brief comment on the workshop being organised by WWF for 1 and 2 December in Madrid to which several members of the Joint Management Committee were invited.

SC monitoring session of 14 December 2016

Ordinary SC session addressing the control panel as well as routine management issues. The following items can be highlighted:

- The data on sand eel catches, both for November and the rest of the year, were presented. Among the group of ports, the 75 % limit marking the warning reference point had not been reached in November, with catches remaining at 74 % of the quota.
- The goby fishing season was prepared. It would start on 16 December with the following distribution of catches:

    - Transparent goby (*Aphia minuta*): Fishing for this species would continue to be carried out by the boats already engaged in this activity (*Nuria* and *Trasmallero*), with 50 % of the quota each (900 kg per vessel), as had been the case so far.
    - Crystal goby (*Crystallogobius linearis*): Opening of the fishery to interested vessels

from the northern zone.

- The representative of the sector in Girona expressed that he did not think it was fair that they could not fish for transparent goby (a problem he said would be eliminated by making changes to the mobility agreements). The sector in Girona accepted the possibility of fishing for crystal goby if all of the vessels that wished to could join the census and if the distribution of the quota were not done by boat, since there could be boats that signed up but that would not actually go out and, in this case, a lot of the quota assigned to those boats would be wasted.

The boats interested in fishing for crystal goby and the fishery sector involved stated that the list of interested vessels was the following:

Nuria, BA-2-3064
Cris-U, BA-3-2-92
Esparta, BA-3-4-02
Llamanto U, BA-3-1-96
Montserrat, BA-3-2103
Pat y Aina, BA-3-2-96
Imposible, BA-3-2.634
Maria Mar Cuatre, BA-3-1-10
Neus II, BA-1-1.227
Marlú, BA-4-1-93
Hermanos Cayuela Dos, BA-5-1-91
Nova Sant Joan, BA-4-1-00
Pare Trias, BA-4-3-01
Rosa Dos, BA-1-1349
Refí, BA-4-1499
Sant Joan Tercera, BA-4-1-11

A reminder was also provided of the quotas established in Order AAM/87/2014 of 20 March 2014 adopting the Management Plan for the *Sonsera* Fishery on the Catalan Coast:

3.8 t of crystal goby
1.8 t of transparent goby

In terms of the distribution of the crystal goby quota, they understood that setting it per boat could mean wasted quotas for the boats in this fishery if the rest of the vessels on the list did not go to sea and that, due to the temporal variability of the species, setting a weekly limit could also be unsuitable for the population dynamic. It was finally agreed to establish a general quota of 380 kg per week and per fleet (which could be cumulative if the limit were not reached during a given week), with a maximum of 15 vessels.
At the same time, it was agreed to start the crystal goby season with an exploratory period, from the beginning of the season until 31 December 2016, during which time fishing activity would only be permitted for two vessels:

º Pare Trias, BA-4-3-01
º Neus II, BA-1-1.227

During this period, where the aim was to carry out an initial evaluation of the fishery to be able to adjust the quotas and their distribution in the following Standing Committee meeting, the agreed quota would be 100 kg per week per vessel.

- The representative of Ecohydros presented the study carried out by this company, for which acoustic research had been undertaken in the sand eel fishing grounds during the months of August and September, with the aim of evaluating the biomass of sand eel populations along the Catalan coast.

SC monitoring session of 17 January 2017

Ordinary SC session addressing the control panel as well as routine management issues. The following items can be highlighted:

- Summary of the 2016 sand eel season. The 2016 sand eel fishing season ended with the following data:

    - In December 2016, 69.6 % of the expected quota had been reached.

    - In the overall calculation for 2016, 88.49 % of the expected quota had been reached; 137 t of the 154 t assigned by quota had been caught. The assigned sand eel quotas had remained very far from the maximums available according to the Management Plan (819 t).

- The sector representatives expressed that due to the limited yield of the last sand eel and goby seasons, mechanisms had to be identified to avoid keeping the sand eel boats moored during the closed season provided for in the Management Plan, which covered December, January and February. If the situation of limited abundance of sand eel and crystal goby continued, it would be necessary for the boats on the census to be able to work in the small gear fleet during the sand eel closed season. In general, all of the members of the SC expressed that solutions needed to be found while taking advantage of the amendments to be made to the Management Plan during 2017, at the end of its third year of implementation. For this purpose, it was agreed **to call a special meeting for 14 February 2017 to debate the proposals for amending and implementing the Management Plan.** That meeting would replace the monitoring session planned for the month of February, since the latter would be unnecessary due to the sand eel fishery's closure.

- Summary of the workshop on sustainable fisheries organised by WWF in Madrid. Lluís Trias (sector), Mauricio Pulido (sector), José Luis García Varas (NGO) and Ángela Seira (administration), all members of the SC, had participated in the workshop. Aspects of some of the issues that had been addressed, such as the fishery and environmental collapse in the Mar Menor (Murcia), were discussed. The topics explored included the management of fisheries in protected natural areas, tools for managing data-poor fisheries and the participatory process as a management tool. In addition, different management plans had been discussed, such as the small-scale fishery plan in Fuerteventura, the plan for boat seine fisheries in the Balearic Islands and the Management Plan for the *Sonsera* Fishery. WWF informed that important fisheries wanted to enter the world of co-management. One of them was the octopus sector in

Galicia.

- First Conference on Sustainable Fisheries in the Mediterranean. Organised by the Aiguamolls de l'Empordá Natural Park. Mauricio Pulido said that he would speak at the conference. He would do so as a representative of the Barcelona *sonsera* sector on the Standing Committee of the Management Plan for the *Sonsera* Fishery's Joint Management Committee. Rosario Allué said she would also participate as head of the Directorate-General for Fisheries and Maritime Affairs' Marine Resources Service.

- Report on the preliminary analysis of the genetic population structure of the sand eel. A summary and the conclusions of the genetics report were presented. The existence of a genetic marker had been confirmed, helping to differentiate between the two species, but the report considered that new markers had to be found. All of the specimens examined, except one, belonged to the *cicerellus* species. The existence of a single population had been detected. Further work would be necessary, with more samples from fishing grounds located further away and separated by a stretch of coast with no sand eel presence.

SC monitoring session of 14 February 2017

Special SC session to review the Management Plan for the *Sonsera* Fishery at the end of its third year of implementation. At the time of the Management Plan's adoption, some changes that would need to be implemented with a view to its improvement had already been identified. However, the Joint Management Committee's Standing Committee and Plenary had managed to resolve some of the issues through the actions that the Director-General of Fisheries and Maritime Affairs and, by proxy, the Joint Management Committee were authorised by the Management Plan to carry out. During the meeting, specific agreements on the points to be amended were not reached. However, they would need to be addressed so that they could be implemented by the end of the Plan. The aspects to be amended are summarised in point 4 of this report.

SC monitoring session of 14 March 2017

Ordinary SC session addressing the control panel as well as routine management issues. The following items can be highlighted:

Following the Director-General of Fisheries and Maritime Affairs' Decision of 28 February 2017, the 2017 sand eel fishing season had begun on 1 March. Pending scientific sampling and reports on sand eel abundance from the sector's fishermen, special permits for fishing for sand eel with the *sonsera* were granted to the vessels on the census, with the same reduced quotas with which the 2016 season had closed. At the same time, two vessels continued to be exclusively engaged in transparent goby (*Aphia minuta*) fishing.

- The representative of the sector in Girona considered that the closed season should have lasted a little longer. The problem was that there were economic issues with prolonging it. They should be able to engage in a different activity, such as transparent goby fishing.

- The representative from Barcelona, who within the SC is responsible for assessing

catches according to the first sale notes, mentioned that some boats had certain problems when it came to reaching the quotas and this could mean that, according to the Management Plan, they would have to reduce still more. The Plan's rules had been established during a time of great abundance in catches and they were now no longer suitable. The closed season should be prolonged a little more, but it should be possible to change the mode of fishing during that period. Both sector representatives were in favour of being able to change the mode of fishing.

- The representatives of the Directorate-General of Fisheries and Maritime Affairs commented that the rules for assessing the catch per unit effort (CPUE) should be different during the first month of the season. In terms of the possibility of combining different modes of fishing, the representatives of the Directorate-General expressed that it was obvious that there was a social context that made this difficult and that different methods had to be identified.

- Given the possibility that 75 % or even 50 % of the expected quota might not be reached and reduction or closure measures might be needed, different possibilities were considered, such as linking the quota to the vessel rather than the average of the vessels. In order to avoid not reaching the expected quota, it was agreed that from 20 March and for at least two weeks, the quota per vessel per day (with three crew members) would be 50 kg, working every other week.

- The representative from the province of Barcelona said that he had observed some non-compliance with the time of departure from the port of Arenys de Mar. He considered that, although there were maximum daily quotas, the sector should comply with the Plan's technical measures. The Directorate-General for Fisheries had also been informed of breaches relating to vessels that had made sales thanks to the vessels' association, without having gone to sea, as well as about sales of excess non-target species. The issue was debated and it was agreed to increase monitoring in the sector to avoid it. In any event, they were occasional and minor cases.

- Lastly, the representative of the national fisheries administration commented that she had been looking for a solution to the issue of transhipment (transferring live sand eel at sea) and could not see any option that would comply with the provisions of current European legislation.

Since the monitoring session of 14 March 2017, when the Plan's three-year implementation period was considered complete, co-management meetings have continued to be held and management measures that, while respecting the legal provisions of the Plan, adapt more to the SC's criteria and the specific needs of the fishery have been implemented. Among these, it is worth highlighting the SC session of 8 June 2017 establishing the protocol to be applied to vessels in the *sonsera* census that wish to temporarily abandon this mode and return to the small gear fishing activity for which they have basic authorisation (small gears, bottom-set longlines or sub-modes for which they are authorised). This protocol was approved in a Joint Management Committee Plenary meeting on the same date.

The conditions established for temporarily leaving the *sonsera* census and rejoining the small gear fleet are the following:

Given that a new temporary closure of the fishery could be caused due to the implementation of the reference points provided for in the Order adopting the Management Plan for the Sonsera *Fishery, the Joint Management Committee's Standing Committee, in its monitoring session of 8 June 2017, proposed a new protocol for managing quotas to prevent this situation from developing again.*

The protocol is based fundamentally on the individualisation of the quotas per vessel per day, so that each vessel, rather than the overall fleet, must comply with the reference points provided for in the Plan. Consequently, implementing the new protocol involves automatically dissolving all current vessels' associations, and each vessel must reach its corresponding quota alone.

This new mechanism could mean that, due to an inability to reach the expected quota targets, some vessels may have to temporarily give up their special permit for fishing with sonsera *and return to the basic small gear fishing activity they are authorised for. However, it is not likely that this situation will affect a high number of vessels, so we believe that the possibility of some vessels joining the alternative mode of fishing would not be traumatic for the rest of the fleets.*

Bearing in mind the situations in which, up until now, the special permit for fishing with sonsera *could be given up or withdrawn, and the new situations that could be brought about by assessing compliance with the individualised quotas, three scenarios where vessels could return to the authorised small gear method are considered. They are presented in the following Mobilisation Protocol for vessels:*

1- If the Joint Management Committee, through its Standing Committee, agrees to close the fishery in compliance with the Plan's reference points or for any other duly justified cause.
2- If the vessel does not reach 50 % of the quota assigned to it within one calendar month. In this case, the vessel can choose between the following two options:

> *a. Give up the special fishing permit for a period of no less than three months and return to the authorised small gear method. The possibility of being eligible for this option ends on 15 September every year.*
>
> *b. Apply a one-month quota reduction of 50 % of the established general quota following this scale:*
>
> > *1. If at the end of the first month the catches are below 50 % of the reduced quota (50 %), the content of point 2(a) above will automatically be applied, even if it is after 15 September.*
> >
> > *2. If at the end of the first month the vessel has achieved catches between 50 % and 90 % of the reduced quota, the reduced quota (at 50 % of the general quota) will remain in place for the second month.*
> >
> > *3. If at the end of the first month the vessel has reached catches exceeding 90 % of the reduced quota (at 50 %), during the second month a quota at 75 % of the general quota will be applied. If during the second month the vessel*

catches over 75 % of the quota reduced to 75 %, it will recover 100 % of the general quota at the beginning of the third month.

The above scale will be applied cyclically where appropriate.

3- If the shipowner voluntarily gives up the special fishing permit before two months have passed since the beginning of the season (before 30 April each year), the vessel will not be able to rejoin until the beginning of the following year's season (1 March).

In general, vessels with a special permit for fishing with sonsera *will not be able to work in any other fishing activity during the closed season from 16 December to 28/29 February. However, vessels that, in accordance with the above points, have returned to the small gear fleet before the end of the season will be able to remain in that activity until the beginning of the next season (1 March), by which time the activity the vessel will be engaged in during the season should have been established by administrative decision.*

The above protocol will be applied universally. However, the MPSJMC's Standing Committee (or the Joint Management Committee itself where appropriate), in compliance with the co-management model, reserves the right to occasionally assess particular cases that may arise and that may require a specific interpretation of the protocol.
Given that implementing the above protocol could involve temporarily removing some vessels from the census, the Standing Committee has agreed to request a report from the European Commission on the possibility of these vessels being substituted by others that are interested in joining this fishery, as long as they fulfil the conditions provided for in the Management Plan.

At the close of this report, 10 of the 26 vessels in the census have temporarily abandoned the *sonsera* fleet and 16 still have the special permit and are waiting for the autumn storms to increase sand eel catchability, as is customary in this fishery. Scientific monitoring of the fishery is still underway in accordance with the sampling and initial data evaluation protocols.

4. Proposal for amendments to the Management Plan and issues to be resolved

The points that should be reviewed at the close of the Plan are explained below:

4.1. Co-management model

Adapt the current co-management mechanism, based on the Management Plan for the *Sonsera* Fishery's Joint Management Committee, which should have been replaced by the *Sonsera* Fishery Joint Management Committee provided for in Article 2(1) of Order AAM/87/2014 of 20 March 2014 adopting the Plan.

Here, it is worth mentioning that the Catalan Government's decree on the governance model for professional fishing in Catalonia will be adopted before the end of 2017. This decree lays down all of the mechanisms for preparing multi-annual management plans and for defining the make-up and operation of joint management committees.

4.2. Management of the census

There is a possibility that the 26-vessel census will be managed by the Autonomous Community in a more efficient way, using socioeconomic mechanisms and, if sand eel abundance is sufficient, also according to social criteria. The Plan should include the Joint Management Committee's obligation to establish the entry and exit (exchange) protocols between the *sonsera* method and the small gear method. Options for giving up the special *sonsera* permit temporarily and/or definitively.

4.3. Review of criteria in order to establish reference points

The criteria are laid down in Article 6 of the Order adopting the Management Plan. Variability in the presence/detection of sand eel throughout the year and also over several years means that, for the time being, it is very difficult to be sure of the abundance of these species. During the preparation of the scientific study prior to the adoption of the Plan and during the implementation of the latter, the Committee had to manage seasons with such abundance of fish that many adjustments had to be made to avoid exceeding the total quota for the entire season (quotas of 600 kg/vessel/day) in just a few months. In other seasons, much smaller quotas (80 kg/vessel/day) were necessary to avoid the seasonal disappearance of the sand eel. Lastly, during the 2017 season, it has been necessary to dissolve the vessels' associations in order to establish fixed quotas for each of the units of the Plan. In this way, and in accordance with the reference points, only some of the vessels were obliged to abandon the activity, rather than the entire fleet. There is still a great lack of knowledge about the behaviour of these species of fish and, therefore, scientific monitoring should continue to be carried out for the purpose of the Plan's continuation. Nevertheless, the SC is aware of the need to open up new lines of research linked to the variability of the physical and chemical parameters of the fishing grounds; research that would facilitate predicting recruitment for each new season and the effort that should be made at any given moment.
Due to the above, the reference points provided in Article 6 need to be reviewed and adjusted according to the seasonal or annual abundance of the target species.

4.4. Option of sharing quotas

Article 8 of the Order adopting the Management Plan provides for the option of establishing associations between vessels, permitting them to share daily quotas. This option has been used with very good results in seasons and periods of great sand eel abundance. This way, hauls could be shared, avoiding unnecessary slipping (opening the end of the net to free excess catch without landing it in the cod-end). In periods when the sand eel is scarce or hard to catch, such as at the beginning of the second half of 2017, the vessels' association option has been eliminated. Quotas must be reached independently by each of the vessels and if they do not achieve this, the reduction protocols will be applied to each of them according to the reference points provided.
The wording of Article 8 will also have to be amended since currently it does not allow associations between vessels from different ports. There are some cases of home ports with only one vessel with a special *sonsera* permit. The wording of the current Plan negatively affects these vessels, which are unable to share quotas.

4.5. Changes to the authorised vessels' schedule

This case is similar to the previous point. The Management Plan only authorises schedule

changes among vessels from the same port. It should be amended to permit exchanges between vessels from different home ports.

4.6. Authorised ports of landing

During the preparation of the Management Plan, one of the Joint Management Committee's main concerns was with monitoring the activity and the landings. From the very start of the Plan's implementation, the Committee identified excessive rigidity in the fact that, according to Article 14, the vessels should leave and return via their authorised home port. The concept of 'home port' is strictly defined in the local legal system, and the change of one home port to another could result in several months of paperwork. The impossibility of selling sand eel in a port other than the vessel's home port has on occasion hindered the resource's management.

4.7. Monitoring the daily quota

Article 7 of the Order adopting the Management Plan provides for mechanisms to monitor the daily quota in order to avoid cheating in relation to any overfishing that may occur. These complex and very effective mechanisms will require certain occasional adjustments based on the volume of the quotas to be applied according to the Joint Management Committee's criteria, probably eliminating the excessive specificity currently contained in Article 7 of the Plan.

4.8. Transhipment of sand eel at sea for its use as live bait for fishing with hooks

Sand eel fishing with *sonsera* originated in the need to provide bait for small gear bottom-set longliners, especially for those that occasionally and temporarily engaged specifically in catching sea bream (*Dentex dentex*) with live bait.

During the implementation of this Management Plan for the *Sonsera* Fishery (specifically for sand eel), a substantial change has taken place in the operation and in the nature of the fishery. Managing the catches has resulted in a very significant increase in the first sale price, which has quadrupled in contexts of normal abundance and increases even further in times of scarcity. Under such conditions, where the per kilo price of sand eel can exceed EUR 20, it would not be economically profitable to use these catches as bait for others.

Nevertheless, and despite the scarcity of sand eel catches in the last two years, we must consider the possibility that in periods of sand eel abundance (which are cyclical according to the fishermen's memory and experience and of a duration that at the moment is unknown from the scientific point of view), small quantities of live bait could be allocated to certain small gear vessels with which the sand eel fishermen share fishing grounds and schedules. In order for these transfers of live bait to be genuinely effective, they should happen at sea, immediately after the haul with the *sonsera*, and that requires what is technically known as 'transhipment at sea'. Despite the fact that this operation has nothing to do in practice with what is understood as transhipment, conceptually it could be considered as such. Consequently, transferring live bait between vessels clashes head-on with Article 20 of Council Regulation (EC) No 1224/2009 of 20 November 2009 establishing a Community control system for ensuring compliance with the rules of the common fisheries policy, the application of which makes the transfer operation practically impossible.

In terms of the Management Plan's future, it may be necessary to design a mechanism that would enable this transfer of live sand eel to small gear vessels working in bottom fishing with hooks.

5. Scientific justification for amending the Management Plan and proposals for modifying the associated scientific study

The report on the scientific monitoring associated with the Management Plan is included as an annex to this report on the Joint Management Committee's actions. The scientific report is an essential tool for technical decision-making and for implementing the reference points. The conclusions and recommendations of the scientific report include not only the justification for the decisions made and the agreements adopted by the SC, but also proposals for adapting the scientific monitoring process to the needs detected.

Barcelona, October 2017

ANNEX. Scientific report

Annex II – Background documentation - PLAN DE GESTIÓN DE LA SONS SERA - Informe a la fiinalización del terceer año de vigencia- ES

Generalitat de Catalunya
Departament d'Agricultura,
Ramaderia, Pesca i Alimentació
Direcció General de Pesca
i Afers Marítims

PLAN DE GESTIÓN DE LA SONSERA

Informe a la finalización del tercer año de vigencia

Barcelona, octubre de 2017

Índice

INFORME RELATIVO AL ESTADO DEL PLAN DE GESTIÓN DE LA SONSERA A LA FINALIZACIÓN DEL TERCER AÑO DE SU APLICACIÓN

1. Introducción

El 28 de marzo de 2014 entró en vigor la Orden AAM/87/2014, de 20 de marzo, por la que se aprueba el Plan de gestión de la sonsera en el litoral catalán (2014-2019). Dicho plan había recibido el visto bueno de la Comisión Europea en fecha 20 de febrero de 2014.

El artículo 1 de la Orden establece una vigencia para el plan de gestión de 5 años , se establece la condición de que sea revisado al final de la tercera anualidad. La peculiaridad del modelo de gestión empleado en este plan consideramos que hace innecesaria la modificación de las medidas técnicas base establecidas mediante la normativa en que se publica el plan de gestión.. La capacidad de reajuste y la gestión en tiempo real que ofrece el modelo de cogestión ha permitido resolver todas aquellas situaciones que se han dado a lo largo de los primeros tres años de vigencia del plan, que difícilmente hubieran podido resolverse en un modelo de gestión convencional. Des del comienzo del estudio preliminar hasta la situación actual la situación del recurso ha canviado drásticamente. La gran abundancia de recurso durante la fase de diseño del Plan de gestión y el primer año de aplicación, propiciaron una gestión comunal de la pesquería que con la posterior caída de las capturas obligó al cierre temporal de la campaña a partir del 2015 y hasta abril del 2016.

Durante 2017, la Comisión Permanente, con la aprobación del Pleno del Comité de Cogestión y con la premisa de la gestión adaptativa que conlleva la Cogestión, se ha a replanteado la aplicación del modelo de gestión comunitaria mediante la asociación de embarcaciones, procediendo a la disolución de las mismas y facilitando a aquellas embarcaciones que no han alcanzado las cuotas establecidas, el abandono temporal de la modalidad de la sonsera y el retorno a la modalidad base de artes menores. Los detalles y la cronología de la evolución de la pesquería a lo largo de los primeros tres años de aplicación del Plan de gestión se describirán a lo largo del presente informe.

2. Breve historia del modelo de cogestión

El 26 de abril de 2012 se constituyó en la sede Dirección General de Pesca y Asuntos Marítimos, el llamado Comité de Cogestión del Plan de Gestión de la Sonsera (CCPGS). El Comité de Cogestión está formado por representantes del sector pesquero, por científicos del Instituto de Ciencias del Mar del Consejo Superior de Investigaciones Científicas (ICM-CSIC), por representantes de las Organizaciones ecologistas no gubernamentales World Wildlife Fund (WWF) y Greenpeace, además de por miembros de la administración pesquera del Gobierno Autónomo y del Gobierno de España (la administración pesquera del Estado se añadió al Comité el 14 de diciembre de 2012).

Entre las funciones principales del CCPGS está la de gestionar la actividad pesquera desde los criterios establecidos en el proyecto de PGS, proponer y coordinar los estudios científicos, participar en el seguimiento del cumplimiento de las medidas de gestión previstas y proponer las medidas adaptativas oportunas en caso de su

incumplimiento. También está entre las funciones del CCPGS presentar propuestas e informar a la CE, a través de la administración competente, sobre aspectos relativos al PGS así como sobre sus posibles modificaciones.

En junio de 2012, sobre la base de lo que prevé el artículo 7 del Reglamento (CE) n. 1224/2009 del Consejo de 20 de noviembre de 2009 por el que se establece un régimen comunitario de control para garantizar el cumplimiento de las normas de la política pesquera común y el artículo 1.2 del Reglamento (CE) 1967/2006, de pesca en el Mediterráneo, la Dirección General de Pesca y Asuntos Marítimos, autoriza a 10 de las 25 embarcaciones propuestas en el PGS a la actividad pesquera de la sonsera con el fin de obtener los datos necesarios para el estudio científico requerido. Esta primera fase de recolección de datos se realiza bajo las medidas previstas en el proyecto del PGS y la supervisión y control del CCPGS.

En agosto de 2012, en el marco de un contrato con el ICM-CSIC, que inicialmente fué financiado por el sector de la sonsera, se iniciaron los muestreos complementarios al análisis de los datos facilitados diariamente por las embarcaciones autorizadas sobre las descargas de especies objetivo y acompañantes efectuadas.

Dentro del CCPGS se constituyó un órgano de trabajo, la Comisión Permanente (CP) que se reúne mensualmente con el objeto de proceder al seguimiento y control de la actividad.

El día 12 de febrero de 2013 se celebró en Barcelona una doble reunión a la que asistieron como observadores invitados dos miembros de la DGMARE de la Comisión Europea. El objetivo principal de esta reunión extraordinaria del plenario del Comité de Cogestión fue la de hacer una exposición sobre el funcionamiento de este comité a los técnicos de la DGMARE. De acuerdo con lo expuesto en la reunión pueden, en relación al modelo de cogestión, constarse una serie de principios que siguen siendo vigentes en la actualidad:

I. Existe una gran implicación del sector en la cogestión de la actividad de la sonsera que conlleva entre otras muchas actuaciones la participación en la financiación del estudio científico.

II. El estudio científico y la evaluación mensual de los desembarcos que tienen por objetivo el conocimiento del estado de la población permite tomar decisiones sobre la fijación de las cuotas por embarcación y día y la necesidad proceder al cierre temporal de la pesquería.

III. La sensación entre el sector pesquero y entre los miembros del Comité es la de estar iniciando un nuevo modelo de gestión pesquera, de cogestión, de corresponsabilidad, que con toda probabilidad puede ser exportable a otras pesquerías. Según expresaron las ONGs, la cogestión es en cierto modo una mirada al pasado, a los antiguos sistemas de autorregulación de los pescadores de pequeña escala que tan efectivos fueron y que se habían perdido con la aparición de las pesquerías industriales.

Con posterioridad a esta reunión informativa y hasta la fecha de entrada en vigor del vigente Plan de Gestión, la actividad del Comité de Cogestión, especialmente de su

Comisión Permanente fue la de valorar y proponer las medidas técnicas de gestión que conformarían el Plan de gestión finalmente aprobado mediante la Orden AAM/87/2014, de 20 de marzo, por la que se aprueba el Plan de gestión de la sonsera en el litoral catalán (2014-2019), que **entraría en vigor el 28 de marzo de 2014**. La aprobación de la Orden del Plan de acuerdo con las medidas técnicas acordadas con la CE y su CCTEP, permite la publicación Reglamento de Ejecución (UE) No 464/2014 DE LA COMISIÓN de 6 de mayo de 2014 por el que se establece una excepción al Reglamento (CE) no 1967/2006 del Consejo en lo concerniente a la distancia mínima de la costa y la profundidad marina mínima para la pesca de sonso (*Gymnammodytes cicerelus* y *G. semisquamatus*) y góbidos (*Aphia minuta* y *Crystalogobius linearis*) con redes de tiro desde embarcación, en determinadas aguas territoriales de España (Cataluña).

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3. Aplicación del Plan de gestión. Sesiones del Comité de Cogestión. Resumen de acuerdos y debates mantenidos.

El día 28 de marzo de 2014 entra en vigor la Orden AAM/87/2014, de 20 de marzo, por la que se aprueba el Plan de gestión de la sonsera en el litoral catalán (2014-2019). A partir de dicha fecha esta orden ha sido el referente legal para la aplicación por parte del comité de cogestión de las medidas técnicas de gestión del Plan.

Seguidamente se relacionan les sesiones de control y reuniones celebradas por la Comisión Permanente (CP) y el Pleno y los principales acuerdos y medidas de gestión aplicadas:

Sesión de control de la CP de 11 de abril de 2014

Se trata de una sesión especial de presentación de la Orden del Plan de gestión a cargo de las principales autoridades de las administraciones pesqueras catalana y española. Antes de entrar en el orden del día previsto y habitual de las sesiones de Control de las CP, el Consejero del Departamento de Agricultura, Ganadería y Pesca de la Generalitat de Catalunya Sr. Josep Maria Pelegrí, que expuso a la CP los motivos de su presencia y del resto de invitados en esta sesión especial. El, director general de Ordenación Pesquera del Estado, Sr. Andrés Hermida , dedicó también unas palabras a la excelencia del modelo de cogestión, especialmente en cuanto a la gestión sostenible del recurso haciendo mención a la sostenibilidad medioambiental, económica y social.

Cerró la presentación de la reunión la presidenta de WWF Internacional, Sra. Yolanda Kakabadse, con palabras de elogio sobre el mecanismo de la cogestión que quiere extender a otras modalidades pesqueras del mundo. Habló de la importancia de la pesca a nivel mundial y de que sin esta actividad la seguridad alimentaria no es posible.

Seguidamente se inició el protocolo estándar de la sesión de control en la que se trataron con carácter general los siguientes puntos:

1- PANEL DE CONTROL

a. Revisión de las capturas de llengüeta (góbidos) del mes de marzo

b. Revisión de las capturas de sonso del mes de marzo
c. Resumen de las actuaciones en materia de inspección pesquera y trazabilidad de las capturas de la sonsera y de las especies objetivo (inspecciones en puerto / mar, Mercado de pescado de Mercabarna, ...)

2 – Todos aquellos temas de gestión de la modalidad propuestos des de la secretaria de la CP o a petición de cualquiera de sus miembros.

Reunión de 12 de mayo de 2014 de una representación de la CP con la administración pesquera del estado.

Se trataron los siguientes temas pendientes:

- Resolución del Estado miembro autorizando la excepción a la malla mínima prevista por el Reglamento 1967/2006 para las redes remolcadas. La sonsera arma en el copo una malla mayor o igual a 2 mm.

- Publicación de la Orden equivalente a la autonómica de adopción del Plan de Gestión de la Sonsera para las aguas exteriores.

- Definir el futuro del Comité de Cogestión del Plan de Gestión de la Sonsera (CCPGS). En estos momentos se estaba trabajando en el borrador de un Convenio que regularía la composición y la distribución de responsabilidades del nuevo Comité de Cogestión de la Modalidad de la Sonsera (CCMS) que sustituiría al que ha estado funcionando durante la preparación del plan de gestión.

- El Plan de Gestión de la Sonsera tiene dos pilares que se deben mantener bajo cualquier circunstancia:

    a) **La corresponsabilidad del sector**. Hay una serie de medidas que deben ser asumidas por el propio sector como la distribución del calendario de trabajo de las cuotas por embarcación y de la forma de compensar los posibles excesos. Esta parte debe ser respetada entre ellos y no requerir la intervención de la administración ni por ello tampoco la publicación de disposiciones del rango de Resoluciones.

    b) **La inmediatez y agilidad** en la aplicación de aquellas medidas de gestión que, de acuerdo con la Orden de adopción del Plan, puedan ser adoptadas por Resolución del director general de pesca.

        - Reducción de cuotas por dictamen científico
        - Renovación anual de los permisos especiales de pesca de la sonsera
        - Ratificación de las posibles medidas provisionales de retirada del permiso especial por infracciones graves.
        - Cierre de la pesquería en caso de no alcanzar el umbral de seguridad de capturas
        - Asociación de embarcaciones para compartir cuota (reducir descartes-en vivo- por superar la cuota diaria.

- Reducción de la campaña por dictamen científico (el Plan requiere un seguimiento científico que inicialmente fue sufragado por los pescadores de la sonsera)
- Modificación de puertos de descarga
- Establecimiento y modificación de los mecanismos de comunicación entre el sector y el Comité de Cogestión.
- Otros

- Establecimiento de un mecanismo legal que permita el transbordo de pequeñas cantidades de sonso vivo en la mar con destino a las embarcaciones de palangre de fondo. No debemos olvidar que el origen de la actividad de la sonsera fue la captura de cebo para el palangre de fondo. El actual Reglamento de Control establece serias dificultades a los transbordos. Habría que contemplar que se trata de pescado vivo, con destino cebo vivo.

Sesión de control de la CP de 14 de mayo de 2014

Sesión ordinaria de la CP en la que además del panel de control se tratan los siguientes puntos de importancia:

- Entrada en vigor del Reglamento de Ejecución (UE) Nº. 464/2014 de la Comisión, de 06 de mayo 2014, por el que se establece una excepción al Reglamento (CE) Nº. 1967/2006 del Consejo en cuanto a la distancia mínima de la costa y la profundidad marina mínima para la pesca de sonso (*Gymnammodytes cicerelus y G. semisquamatus*) y góbidos (*Aphia minuta y Crystalogobius linearis*) con redes de tiro desde embarcación, en determinadas aguas territoriales de España (Cataluña).

- Inicio de la campaña pesquera del sonso en el marco del Plan de Gestión adoptado por la Orden AAM / 87/2014, de 20 de marzo, por la que se aprueba el Plan de gestión de la sonsera el litoral catalán.

- Transbordos en el mar de sonso vivo como cebo para los palangres de fondo. Posibilidad de excepción a la prohibición del Reglamento de Control.

- El sector propone se debate y se acepta una cuota para el mes de junio de 500 Kg por embarcación y día de 3 o más tripulantes y una cuota de 379 kg por embarcación y día de hasta 2 tripulantes.

Sesión de control de la CP de 10 de junio de 2014

Sesión ordinaria de la CP en la que se trata sobre el panel de control y de algunos temas menores. Se estudia el tema del transbordo de sonso para cebo vivo, peticiones de incorporación al censo de nuevas embarcaciones, cambios de base, etc.

Sesión de control de la CP de 15 de julio de 2014

Sesión ordinaria de la CP. En esta sesión se tratan además del panel de control aspectos muy importantes para el futuro del plan de gestión. Se

comentan los contenidos de los recursos contencioso-administrativos que han sido presentados a la Orden de aprobación del Plan de gestión. Fundamentalmente van dirigidos contra el censo cerrado de la flota del Plan y a la imposibilidad de incorporación de nuevas embarcaciones al censo. Este hecho viene condicionado por la necesidad de acreditación de un mínimo de 5 años a la actividad prevista en el Reglamento (CE) 1967/2006. Las partes recurrentes no están conformes con dicha limitación y solicitan la impugnación de la Orden.

- Lectura del recurso presentado por UNACOMAR ante el Consejero de Agricultura, Ganadería, Pesca, Alimentación y Medio Natural, en relación a la publicación de la Orden AAM / 87/2014, de 20 de marzo, por la que se aprueba el Plan de gestión de la sonsera el litoral catalán.
- Lectura del informe preparado por la Dirección General de Pesca y Asuntos Marítimos.
- Lectura del recurso contencioso administrativo presentado por la Cofradía de Pescadores de San Telmo de Arenys de Mar contra la Orden de adopción del Plan de gestión.
- Lectura del informe preparado por la Dirección General de Pesca y Asuntos Marítimos a petición de la Asesoría Jurídica del Departamento de Agricultura Ganadería, Ganadería, Pesca, Alimentación y Medio Natural para solicitar al Tribunal Superior de Justicia de Cataluña la no aplicación de la medida cautelar de suspensión de la Orden solicitada por la parte recurrente.
- Lectura del informe presentado por el letrado Sr. Francisco Sánchez Muñoz, en nombre de un grupo de armadores de artes menores en relación al contencioso administrativo presentado por él mismo contra la Orden AAM / 87/2014, de 20 de marzo.
- Propuesta de reforma de determinados puntos de la Orden de adopción del plan de gestión de la sonsera.
- Resolución de otorgamiento de los permisos especiales y otros requerimientos de la Orden AAM / 87/2014, de 20 de marzo.
- Borrador del Convenio de creación del Comité de Cogestión de la Modalidad de la Sonsera.
- Estado de tramitación de la Orden de Aguas exteriores.
- Estado de tramitación de la posibilidad de transbordo de sonso vivo en el mar.
- Petición de acceso al censo de nuevas embarcaciones

<u>Sesión de control de la CP de 9 de septiembre de 2014</u>

Sesión ordinaria de la CP en la que además del panel de control se tratan temas habituales.
Como punto de especial interés se trata el tema de la sustitución de una de las embarcaciones del censo. Se sustituye "EL BOLERICO" por la embarcación "SOL IXENT IV" (3a BA-1 3-97)". La Orden de aprobación del plan de gestión de la sonsera prevé la posibilidad de sustitución de embarcaciones del censo siempre y cuando reúnan las condiciones técnicas de no superar los 10 metros de eslora total ni los 75 kw (100,57 HP) de potencia.

<u>Sesión de control de la CP de 14 de octubre de 2014</u>

Sesión ordinaria de la CP en la que además del panel de control se tratan temas habituales.
Como punto de especial interés se comenta la interposición de un nuevo contencioso administrativo presentado por un grupo de armadores de artes menores de Badalona. El tratamiento que desde los Servicios Jurídicos del Departamento de Agricultura se da al contencioso es el mismo que en los casos anteriores en los que se pedía como medida cautelar la incorporación provisional de los armadores de Badalona al censo específico. Los informes ya fueron en su día valorados por la Comisión Permanente.

Sesión de control de la CP de 13 de noviembre de 2014

Sesión ordinaria de la CP en la que además del panel de control se tratan los temas de gestión habituales

Sesión de control de la CP de 9 de diciembre de 2014

Sesión ordinaria de la CP en la que además del panel de control se tratan los temas de gestión habituales. Como temas de especial importancia se trata el cierre de la campaña del sonso que finaliza el día 15 de diciembre y se debaten las condiciones de inició de la campaña de la llengüeta (*Aphia minuta)* y *(Crystalogobius linearis).*

Sesión de control de la CP de 27 de enero de 2015

Sesión ordinaria de la CP en la que además del panel de control se tratan los temas de gestión habituales que en este caso afectan exclusivamente a la llengüeta por estar el sonso en período de veda. Como temas de especial relevancia se tratan los siguientes:

- Petición de la barca “Elisa” manifestada telefónicamente y a través del representante del sector de la sonsera de Girona, de incorporarse a la pesca del sonso a partir del inicio de la campaña. Esta embarcación pese a formar parte del censo de sonseras del plan de gestión no había participado de la pesquera desde la aprobación del Plan.
- Invitación a miembros del CCPGS la presentación de la experiencia del Comité en el marco de creación de un plan de gestión de la Reserva Natural de Strunjan, el área marina protegida más grande de Eslovenia. Asistirá WWF y también el Sr. Mauricio Pulido, como representante del sector en la Comisión Permanente del Comité de Cogestión.
- Desplazamiento a Portugal. Visita catalana en Peniche (Portugal) los días 11 y 12 de febrero donde se tratarán también temas de cogestión como la sonsera o la gamba de Palamós. Rita Sà, representante WWF en Portugal, comenta que se trata de un proyecto de cofinanciación europea que quiere conocer la experiencia de Cataluña en la cogestión. En estos momentos están todavía evaluando la pesquería en la que pueda ser de aplicación la cogestión.
- Workshop en Barcelona de finalización del proyecto europeo GAP 2. Los días 24, 25 y 26 de febrero. Al Workshop asistirá también un representante del

Gobierno de Portugal. Está previsto además la asistencia de más de 100 personas de diferentes nacionalidades y se tratarán aspectos relativos a la cogestión, fundamentalmente en el Mediterráneo: El sonso, la gamba de Palamós y la merluza de Roses.

- Participación de WWF en la gestión del "jonquillo" de Baleares (modalidad de arte de tiro similar a la de la sonsera. WWF quiere incorporarse a la gestión del jonquillo de Baleares dentro del comité formado por la administración y los pescadores. El día 9 de febrero WWF participará a la de las reuniones por primera vez y a partir de esta fecha está previsto que asista regularmente.

Sesión de control de la CP de 19 de febrero de 2015.

Sesión ordinaria de la CP en la que además del panel de control se tratan los temas de gestión habituales. Cabe destacar los siguientes:

- Inició de la campaña del sonso el día 1 de marzo: Las primeras dos semanas de campaña y también las dos últimas, todas las barcas que dispongan de permiso especial de pesca podrán salir a pescar. Las cuotas iniciales serán de 100 kg por embarcación y día, en el caso de dos tripulantes y de 133 kg por embarcación y día para las de más de 2 tripulantes.
- De las 26 embarcaciones censadas en el plan de gestión de la sonsera, dos de ellas no se habían incorporado aún a la actividad de la sonsera por haber dirigido su pesquera hacia otras modalidades. A fecha de hoy, las embarcaciones "Marlu 3ª BA-4 1-93" y "ELISA 3ª BA-2 3754", han solicitado la incorporación a la actividad el próximo día 1 de marzo y por tanto piden la concesión del permiso especial de pesca con sonsera.
- Los armadores de la embarcación del "BOLERICO 3ª CP-1 1-96" han solicitado el cambio del censo de esta embarcación en favor de "EL BOLERICO II 3ª BA-1 3-97" (Antes Sol Ixent IV).

Sesión múltiple de 17 de marzo de 2015

Durante esta jornada se convocan tres reuniones de ámbito distinto.

- 12.00 horas. Reunión del Pleno
- 15.30 horas. Sesión de control de la CP
- 17.00 horas. Asamblea con el colectivo de pescadores de la sonsera y los representantes del sector pesquero

Reunión del Pleno. La CP pone al corriente a los miembros del Pleno sobre las reuniones y las sesiones informativas efectuadas, la actividad inspectora y sancionadora. Se hace un breve resumen de la evolución del seguimiento científico: evaluación de la relación (proporción) entre las capturas teóricas y las capturas reales efectuadas, distinción talla/peso entre el sonso azul y el sonso rubio, diferencias de tamaño entre las campañas 2013 y 2014, estado de madurez de hembras y machos, cálculo de la CPUE, etc.

Sesión de control. Se tratan temas relativos a la valoración de la campaña de llengüeta y continuidad de embarcaciones, previsión de calendario de las

embarcaciones de sonso y llengüeta, cuotas máximas por embarcación durante las próximas jornadas.
El monotema de la sesión gira en torno a la apreciación por parte del sector de la **práctica desaparición de las capturas de sonso durante el inicio de la campaña** y las medidas extraordinarias que probablemente se tendrán que tomar. La semana anterior se produjo el cierre de la pesquería durante una semana a petición del propio sector por falta de capturas.

Finalmente se establecen una cuota máxima de 100 kg/ embarcación día en calendario de trabajo de semanas alternas.

Asamblea con los pescadores de la modalidad. Se informa al sector de la sonsera sobre los temas que anteriormente se han tratado en la sesión del Pleno de la mañana.

Sesión de control de la CP de 22 de abril de 2015

Sesión ordinaria de la CP en la que además del panel de control se tratan los temas de gestión habituales. Cabe destacar los siguientes:

- Estado de tramitación del proyecto de Orden de Plan de Gestión de la Sonsera para las aguas exteriores. Presentación del borrador de Orden.
- Posibilidad de incremento del censo de embarcaciones del Plan de Gestión de la Sonsera.

En relación al sonso, el mes de marzo ha sido muy malo y el sector ha estado y está todavía muy preocupado. No obstante, las últimas semanas se están alcanzando las cuotas previstas que son sólo de 100 kg por embarcación y día.

Sesión de control de la CP de 19 de mayo de 2015

Sesión ordinaria de la CP en la que además del panel de control se tratan los temas de gestión habituales. Cabe destacar los siguientes:

- Las cuotas diarias reducidas. En este momento la mayoría de la flota las captura sin demasiado problema. El sector tenía previsto proponer un incremento de cuota hasta 150 kg/día. No obstante el incremento de beneficios sería muy reducido y quizás algunas de las embarcaciones no pudieran alcanzar la nueva cuota. Se decide mantener la cuota de 100 kg.

- Según informaciones facilitadas por diversos testimonios una de las embarcaciones del censo ha capturado un cardumen de seriolas (*Seriola dumerili*), especie no autorizada para la sonsera. Se encarga al secretario que investigue a través de los representantes de sector la veracidad o no de los hechos denunciados.

- Ante una nuevo proyecto de dragado en la zona de Arenys de Mar, se acuerda preparar un documento dirigido al Ministerio de Agricultura, Alimentación y Medio Ambiente por el que se solicite la creación de un grupo técnico pluridisciplinario que estaría formado por miembros del Comité, por otros

representantes del sector pesquero, representantes de la demarcación de costas, de las administraciones locales y de la empresa concesionaria.

Sesión de control de la CP de 17 de junio de 2015

Sesión ordinaria de la CP en la que además del panel de control se tratan los temas de gestión habituales. Cabe destacar los siguientes:

- Tras haber sido verificados los hechos de la embarcación responsable de la captura de un lance de seriolas, tratado en la sesión de control anterior, la CP ha convocado a los patrones de las dos embarcaciones implicadas en los hechos. Después de haber preguntado a los asistentes, la CP visto que las explicaciones y justificaciones, se debate y acuerda imponer una sanción a la embarcación en el marco de sus funciones, procediendo a la retirada temporal (por un mes) del permiso especial de pesca con sonsera, debiendo la embarcación dedicarse a la modalidad base de artes menores que tenga autorizada.

- Se distribuye entre los asistentes el informe efectuado por la embarcación Lluerna en relación a la zona de extracción, recorrido y zona de vertido de arena de la draga contratada por la regeneración de playas del Maresme. Está prevista una reunión en la Subdirección General para la Protección de la Costa. Se acuerda hacer una propuesta de asistentes formada por un representante del ICM-CSIC, un representante de WWF, un representante del sector pesquero de la demarcación de Barcelona, un representante del sector pesquero de Barcelona de la sonsera y un representante de la DGPAM.

- El representante de WWF informa a la Comisión que se celebrará una reunión/taller con otras comunidades autónomas con planes de gestión de artes de tiro desde embarcación, Baleares y Murcia, se celebrará en Barcelona los próximos días 12 y 13 de septiembre de 2015. La organización de esta reunión fue propuesta en reuniones anteriores por WWF y será organizada por esta ONG. Asistirán a la reunión los representantes en la Comisión permanente de la sonsera.

Sesión extraordinaria de la CP de 6 de julio de 2015

Sesión extraordinaria convocada a petición de los representantes del sector pesquero de la sonsera en vistas las medidas extraordinarias de cierre de la pesquería que se pueden adoptar debido a la caída de las capturas del último mes.

Interviene en primer lugar el representante de la sonsera de Girona quien asegura que a pesar de que las capturas del mes de junio han sido buenas en relación a las capturas esperadas, la última semana del mes de junio y la primera de julio han sido muy malas y el sonso prácticamente ha desaparecido. De acuerdo con las notas de primera venta se ha alcanzado durante el mes de junio el 88% de las cuotas en los días en que se han efectuado ventas. Con respecto a la totalidad de la cuota disponible ha alcanzado sólo el 64,9% de las posibilidades. De acuerdo con el artículo 6.6 de la Orden del Plan de Gestión,

esta situación obliga a la reducción de la cuota a la mitad. Se acuerda aplicar una cuota de 250 kg semanales para barca (50 kg por barca y día de pesca), de acuerdo con el calendario de semanas alternas vigente, con un máximo de 100 kg por barca y día.

El viernes día 17 de julio al mediodía se evaluarán las capturas de las dos semanas anteriores y se valorará el porcentaje de cuota alcanzada. En función de estos datos y en aplicación de lo previsto en el plan de gestión, se continuará dos semanas más en la misma situación o se procederá a cerrar la pesquería. No se considera la posibilidad de volver a efectuar una nueva reducción de cuota a la mitad de los 50 kg por barca y día actuales.

Se acuerda que en caso de que se tenga que proceder al cierre de la pesquería en aplicación de lo previsto en el artículo 6.6 de la Orden AAM/87/2014, se mantendrán en vigor los permisos especiales de pesca de manera que las embarcaciones no puedan dedicarse a ninguna otra actividad de artes menores. En caso de que alguna embarcación solicite la retirada del permiso especial para poder dedicarse a otras actividades pesqueras, se valorará particularmente cada caso y se acordarán las condiciones de la retirada y de la renovación de este permiso especial.

Dada la importancia y las repercusiones que las condiciones que el cierre de la pesquería puede tener sobre el resto del sector pesquero acuerda hacer llegar copia de la presente acta a la directora general de Pesca y Asuntos Marítimos, por si considera adecuado hacerla llegar al plenario del Comité de Cogestión.

- WWF informa que la 2ª Conferencia de la CGPM sobre las artes menores en el Mediterráneo se celebrará en Argelia entre el 7 y el 10 de marzo y que el modelo de cogestión de la sonsera estará nuevamente sobre la mesa.

- WWF comenta que el encuentro de comités de artes de tiro desde embarcación con Baleares y Murcia, está prevista para el sábado 12 de septiembre. Comenta que quizás no sea buena fecha dado que coincide con un puente de tres días y con el día siguiente a la Fiesta Nacional de Cataluña. Se acabará de valorar si se mantiene o no esa fecha.

<u>Sesión de control de la CP de 8 de septiembre de 2015</u>

Sesión en la que se valora el actual cierre de la pesquería iniciado en fecha 17 de julio de 2017 de acuerdo con las siguientes consideraciones:

- Se analiza la **paralización temporal extraordinaria de la pesca con sonsera con efectos a partir del día 20 de julio de 2015, a las 00.00 horas y hasta el día 15 de diciembre de 2015.**
- De acuerdo con lo previsto en el artículo 10.3 de la Orden AAM/87/2014, de 20 de marzo, por la que se aprueba el Plan de gestión de la sonsera el litoral catalán, las embarcaciones no podrán dedicarse a ninguna otra actividad pesquera o marisquera durante el cierre.
- Dada la situación de fuerza mayor provocada por la práctica desaparición de las capturas de sonso, situación desconocida desde

que se efectúa el seguimiento científico de esta pesquería, se mantendrá un muestreo continuado como parte del seguimiento del Plan de gestión en el que participarán embarcaciones censadas de ambas provincias marítimas. No se podrán desembarcar ni comercializar los ejemplares capturados, excepto en el caso de aquellos que tengan por destino el análisis científico en los laboratorios del ICM-CSIC de Barcelona.

Sesión de control de la CP de 22 de octubre de 2015

Se mantiene el cierre de la pesquería. Se tratan los siguientes temas:

- Se tratan las diversas posibilidades para que las embarcaciones de la sonsera puedan subsistir económicamente durante los dos meses y medio de veda del sonso, una vez finalizado el periodo de cobro de la prestación de desempleo. De acuerdo con lo que se pidió en la última reunión de la Comisión Permanente sobre la posibilidad de que la sonsera pudiera ser objeto de financiación por vedas, el acuerdo de la Comisión Sectorial incluye la posibilidad de que Cataluña, excepcionalmente para la pesquería del sonso, pueda convocar ayudas de paralización temporal de la pesquería del sonso en el marco de los fondos FEMP y según los acuerdos de la Conferencia Sectorial de Pesca del Ministerio de Agricultura Pesca, Alimentación y Medio Ambiente.
- En relación a la repentina desaparición del sonso, el representante de ICM-CSIC comenta que a pesar del esfuerzo del comité de cogestión, no se controla el 100% del sonso. Hay muchas incertidumbres como por ejemplo la hipótesis de que el incremento de la temperatura del agua de este año haya afectado de forma muy grande al reclutamiento. Comenta la posibilidad de la contratación de un seguro para emergencias como la actual. Entre los presentes se comenta que existen entidades aseguradoras pero que las primas ante tan pocos datos son muy elevadas.
- Se presenta Marie-Emile Guélé, observadora de WWF en la sesión e informa sobre la labor de colaboración con Susana Sainz-Trápaga para organizar la sesión de WWF en la próxima sesión de la Comisión General de Pesca del Mediterráneo (CGPM) a celebrar entre los días 7 y 10 de marzo de 2016 en Argel. Marie-Emile Guélé comenta que se analizarán seis casos de cogestión:

  - 2 casos de cogestión en Croacia vinculados a parques naturales.
  - 1 caso de cogestión en Argelia vinculado también a parques naturales.
  - El caso de la sonsera en Cataluña.
  - El Caso de MEDERNET también en Cataluña
  - 1 artículo científico sobre cogestión de parques naturales.

  Se comenta que los cuatro años de experiencia en cogestión han permitido al Comité de Cogestión detectar todo tipo de problemas y aprender a seguir adelante tanto en las buenas épocas como en las malas. Comenta que espera que la CGPM adopte este método de gestión en todo el Mediterráneo.

Sesión de control de la CP de 24 de noviembre de 2015

Se mantiene el cierre de la pesquería. Se tratan temas varios de gestión de la flota de la sonsera y las licencias pero el tema fundamental es la reunión de la Comisión Sectorial de Pesca del próximo jueves 19 de noviembre de 2105 a celebrar en Madrid, donde se tratará el tema de las vedas y las posibles ayudas del Fondo Europeo Marítimo y Pesquero (FEMP).

Sesión de control de la CP de 19 de enero de 2016

El sonso está ahora en época de veda. Se tratan los siguientes temas:

- La campaña de la llengüeta (góbidos) se ha iniciado con normalidad. Pescan sólo dos embarcaciones: el Trasmallero y la Nuria, que se dedican a la *Aphia minuta*. Este año no hay campaña del *Crystallogobius*, pero se comenta que habría que hacer un muestreo para comprobar la abundancia de la especie
- Representantes del ICM-CSIC comentan que no ha aparecido sonso en el último muestreo efectuado. Para la próxima semana está previsto un muestreo e investigación en barca grande de Blanes. Se buscará sonso y *Crystallogobius*. El ICM-CSIC tiene la intención de hacer una búsqueda de sonso en lugares no habituales como por ejemplo a mayor profundidad.
- Se trata el tema de la Conferencia Regional de Argel para las pesquerías sostenibles de pequeña escala. Para evitar repetirse en el tema del funcionamiento del CCPGS, en esta ocasión se acuerda dirigir la participación a lo que sería la gestión de la crisis provocada por la escasez de sonso de 2015. El tema sería "La gestión de una crisis". El representante del ICM-CSIC propone que como conclusión de la Conferencia sería interesante se pidiera a la CGPM que se llegara a alguna recomendación en favor de la cogestión pesquera.

Sesión de control de la CP de 23 de febrero de 2016

Sesión ordinaria de la CP en la que además del panel de control (capturas e inspección de llengüeta) se tratan los temas de gestión habituales. Cabe destacar los Siguientes:

- Ante la inmediatez del inicio de la campaña del sonso el próximo día 1 de marzo la representante del ICM-CSIC informa a la CP que los resultados del muestreo efectuado el día 22 de febrero hay dos puntos de vista:

  a) Visión optimista. Se ha encontrado sonso en Blanes y en Arenys de Mar, pero no en St. Feliu de Guíxols ni en Palamós. Algunos quilos de ejemplares muy pequeños y algunos de gran tamaño todavía en fase de reproducción. El sonso rubio se está reproduciendo y hay más sonso rubio que azul.

  b) Visión pesimista. Hay muy poco.

  Finalmente en este punto se acuerda que los representantes del ICM-CSIC emitirán un dictamen en relación a la valoración de la evolución de los muestreos efectuados desde el cierre de la pesquería del sonso el mes de julio de 2015. El informe pondrá de manifiesto que no hay indicios suficientes como para considerar que el sonso se recupere este año y que además, según los últimos muestreos, la puesta se ha retrasado. Por estos motivos recomendarán

que se retrase el inicio de la campaña de pesca, prevista de acuerdo con el Plan de gestión para el día 1 de marzo. Los representantes del sector consideran también que por el bien del Plan de gestión hay que retrasar el inicio de la campaña. Durante las próximas semanas se harán muestreos con múltiples embarcaciones para valorar la evolución de la abundancia y el tamaño del sonso. La CP propone que se mantenga el cierre de la pesquería. Mientras no se pueda reabrir se solicitará en el Instituto Social de la Marina (ISM) la prestación del paro para las tripulaciones y patrones.

Sesión de control de la CP de 17 de marzo de 2016

Sesión ordinaria de la CP en la que además del panel de control (capturas e inspección de llengüeta) se tratan los temas de gestión habituales. Cabe destacar los Siguientes:

- El representante del ICM-CSIC informa del último muestreo de sonso efectuado. La situación ha mejorado respecto al muestreo anterior. En Arenys de Mar se han detectado varios cardúmenes pequeños, de unos 5 kg y se han obtenido dos muestras y en Playa de Aro se capturó un cardumen de 100 kg. Se han encontrado algunos sonsos grandes tanto de azul como de rubio, entre 14 y 15 cm ovados. Los ejemplares pequeños (3 a 5 cm) son todos de sonso rubio y los ejemplares entre 6 y 12 cm son todos de sonso azul. Se ha detectado reclutamiento. Los representantes del sector coinciden en que la situación ha mejorado pero en cualquier caso no hay suficiente abundancia para reabrir la pesquería. El ICM-CSIC propone un muestreo cada 15 días y el sector propone muestreo de 6-7 barcas el día 29 de marzo con la intención de poder abrir la pesquería el día 4 de abril si los resultados del muestreo lo permiten. También comenta que algunas de las barcas no sería necesario que embarcaran el arte, bastaría saliendo a detectar cardúmenes con sondador aunque no siempre se puede garantizar que el pescado detectado sea sonso sin calar el arte. En el caso que se detecte un incremento de la abundancia de sonso, se podría concretar una sesión extraordinaria de la Comisión Permanente para decidir la posibilidad y las condiciones de la apertura de la pesquería.

- El sector de la sonsera considera que deberían establecerse unos acuerdos para fijar las condiciones de acceso a las artes menores y la de reingreso a la modalidad de la sonsera en caso de que apareciera sonso más adelante. Habría que establecer también un mecanismo y unas condiciones para una dedicación a la sonsera de una parte de la flota mientras la otra se dedica a las artes menores.

- Uno de los observadores propone que pueda autorizarse el desplazamiento de determinadas embarcaciones a la zona del delta del Ebro donde es conocida la abundancia de *Aphia minuta*. El secretario recuerda que esta zona está fuera del ámbito de aplicación del Plan de gestión y por tanto de las excepciones a la medida mínima de la malla en el copo del arte y de la distancia a la costa y fondo mínimo y, por tanto, no puede autorizarse.

Sesión de control de la CP de 14 de abril de 2016

Sesión ordinaria de la CP en la que además del panel de control (capturas e inspección de llengüeta) se tratan los temas de gestión habituales. Cabe destacar los siguientes:

- De las dos embarcaciones dedicadas a la pesca de llengüeta, la embarcación TRASMALLERO ha finalizado la campaña de llengüeta una vez alcanzada la mitad de la cuota (900 kg). La embarcación NURIA seguirá mientras no alcance el total de cuota de 1800 kg o finalice la campaña el día 30 de abril.

- ICM-CSIC comenta que se han localizado muchos cardúmenes grandes de sonso a la profundidad habitual que es de unos 8 metros. En cuanto a las tallas del sonso, son tallas del año, son inmaduros. Este año la pesquería dependerá del reclutamiento. El sector cree que este año no habrá problema para acabar la campaña con capturas suficientes. **Hay unanimidad en la intención de volver a pescar a partir del lunes 18 de abril.** El sector ha votado y de 24 votos (hay dos embarcaciones que no votan porque están dedicándose a la llengüeta), 22 han sido favorables a volver a pescar el día 18 de abril.
  Se debate el tema de la cuota y finalmente se acuerda una cuota reducida de 80 kg para las embarcaciones de 3 o más tripulantes. Para las embarcaciones de 2 tripulantes se fijará la cuota con base a la proporción habitual resultante fue de 61 kg por embarcación y día. Las cuotas se revisarán por acuerdo de la Comisión Permanente en base a la abundancia de sonso y los precios de venta en lonja. El calendario de trabajo será de semanas alternas. De las 24 embarcaciones un grupo pescará la semana del 18 y la otra la del 25 de abril. A partir del mes de mayo se establecerá un calendario de trabajo para toda la campaña con las 25 embarcaciones que quieren dedicarse al sonso. La embarcación TRASMALLERO, por motivo de la gran distancia que lo separa del caladero de sonso, ha pedido la revocación para la campaña 2016 del permiso especial de sonsera.

- Se considera que es un buen momento para recuperar la posibilidad de efectuar una campaña de acústica para evaluar las poblaciones de sonso. WWF ofrece una nueva oferta de seguimiento acústico.

Jornada técnica de la CP de 28 de abril de 2016

Sesión técnica en la que el colectivo científico informa a la CP de la evolución de determinados parámetros a lo largo del seguimiento científico. También se informa de la prospección acústica de WWF.

Sesión de control de la CP de 24 de mayo de 2016

Sesión ordinaria de la CP en la que además del panel de control se tratan los temas de gestión habituales. Cabe destacar los siguientes:

- De acuerdo con los datos de las notas de primera venta y en relación al *Aphia minuta* ha desembarcado un total de 1433 kg del total de los 1800 kg capturables como cuota máxima prevista en el PGS.

- Tras varias propuestas que intentan mejorar el rendimiento de las cuotas y evitar mortalidades innecesarias de sonso, se acuerda establecer un nuevo mecanismo de distribución y cómputo de las cuotas diarias por embarcación en el caso de situaciones como la actual que se puede denominar de "cuota reducida". La dificultad para ajustar los desembarques los porcentajes de tolerancia previstos en el artículo 7 de la Orden AAM/87/2014 de aprobación del Plan de gestión en el caso de estas cuotas reducidas (actualmente 80kg/embarcación/día), hace que haya sido necesario establecer por acuerdo un mecanismo de distribución de cuota que resuelva la problemática dando cumplimiento al mismo tiempo a lo previsto en el citado artículo 7 del Plan de gestión.

- La cuota y el mecanismo de distribución a lo largo de la semana es el siguiente:

  a) Embarcaciones de 3 o más tripulantes:

  - La cuota máxima diaria por embarcación de lunes a jueves es de 100 kg
  - La cuota máxima diaria por embarcación el viernes es de 80 kg
  - Se establece una cuota máxima semanal por embarcación de 400 Kg.

  Sobre las cuotas diarias anteriores se aplicarán las tolerancias y las compensaciones previstas en el artículo 7 de la Orden AAM/87/2014 así como la posibilidad de compartir cuotas entre embarcaciones asociadas del artículo 8 de la misma Orden.
  En caso de que una embarcación en los cuatro primeros días de la semana haya alcanzado los 400 kg de cuota máxima semanal, el viernes deberá permanecer amarrada a puerto.
  Los excesos diarios de hasta el 10% se compensarán el último día de trabajo de la semana de forma que no se superen los 400 kg máximos semanales. En caso de que el último día de trabajo de la semana se cometa un exceso de hasta el 10% que provocaría un exceso en los 400 kg máximos semanales se compensaría el último día de trabajo de la semana siguiente.

  b) Embarcaciones de 2 tripulantes:
  - La cuota máxima diaria por embarcación de lunes a jueves es de 76,25 kg
  - La cuota máxima diaria por embarcación el viernes es de 61 kg
  - Se establece una cuota máxima semanal por embarcación de 305 Kg

  Sobre las cuotas diarias anteriores se aplicarán las tolerancias y las compensaciones previstas en el artículo 7 de la Orden AAM/87/2014 así como la posibilidad de compartir cuotas entre embarcaciones asociadas del artículo 8 de la misma Orden.
  En caso de que una embarcación en los cuatro primeros días de la semana haya alcanzado los 305 kg de cuota máxima semanal, el viernes deberá permanecer amarrada a puerto.

Los excesos diarios de hasta el 10% se compensarán el último día de trabajo de la semana de forma que no se superen los 305 kg máximos semanales. En caso de que el último día de trabajo de la semana se cometa un exceso de hasta el 10% que provocaría un exceso en los 305 kg máximos semanales se compensaría el último día de trabajo de la semana siguiente.
Las cuotas y mecanismo de distribución se desarrollan de acuerdo a lo previsto en el punto 4 de la Resolución del director general de Pesca y Asuntos Marítimos de 15 de abril de 2016 de concesión de los permisos especial de pesca de sonso con sonsera para la campaña 2016 y reflejan lo acordado en la sesión de control de la Comisión Permanente del CCPGS de 24/05/2016. Las cuotas y el mecanismo de distribución serán de aplicación a partir del lunes día 30 de mayo de 2016.

Sesión de control de la CP de 19 de julio de 2016

Sesión ordinaria de la CP en la que además del panel de control se tratan los temas de gestión habituales. Cabe destacar los Siguientes:

- En resumen se ha alcanzado el 93% de la cuota fijada. Algunos de los puertos tienen un éxito del 100%. En general la pérdida de cuota se debe a aquellas embarcaciones pequeñas y sin demasiada experiencia que usualmente no alcanzan la cuota asignada.
- Dada la abundancia de sonso y esperando que los precios subirán ligeramente durante el verano, el sector pide un ligero incremento de cuota que pasaría de 80 kg a 100 kg por embarcación y día en el caso de más de 2 tripulantes embarcados. Para embarcaciones de dos tripulantes la cuota se incrementaría desde los 61 kg actuales en la misma proporción.
  Se pide también que se utilice el mecanismo de gestión vigente aplicable a cuotas reducidas como las actuales de forma que la cuota semanal (500 kg para más de dos tripulantes) pueda distribuirse a partes iguales de lunes a jueves (125 kg/día).
- Seguimiento acústica del sonso. Esta semana se trasladará el barco al puerto de Arenys de Mar para el estudio de acústica. Tienen previsto que las primeras pruebas de calibración se efectúen durante la próxima semana del 25 de julio.

  Primero se calibrarán los sensores con sonso vivo que será capturado por la embarcación "ESPARTA", se introducirán en una jaula que permita que se entierren en la arena. Se propone que la DGPAM autorice la actividad científica con ambas embarcaciones, una para el montaje de los equipos acústicos de seguimiento, facilitada por la empresa y la otra, la Esparta, embarcación con permiso especial para la sonsera con base en el puerto de Arenys de Mar.

Sesión de control de la CP de 20 de septiembre de 2016

Sesión ordinaria de la CP en la que además del panel de control se tratan los temas de gestión habituales. En esta reunión no hay temas específicos que destacar.

Sesión de control de la CP de 13 de octubre de 2016

Sesión ordinaria de la CP en la que además del panel de control se tratan los temas de gestión habituales. Cabe destacar los siguientes:

- Estudio sobre la aplicación de la genética en la gestión de la pesquería de dos especies de alto valor comercial: el sonso, *Gymnammodytes cicerelus* y *Gymnammodytes semisquamatus.* Se pide la colaboración del sector para aportar muestras que permitan determinar la existencia de distintas poblaciones.

Sesión de control de la CP de 15 de noviembre de 2016

Sesión ordinaria de la CP en la que además del panel de control se tratan los temas de gestión habituales. Cabe destacar los siguientes:

- Actualización del proyecto MedFISH y próximos pasos relacionados con la pesquería del sonso. Breve comentario del taller organizado por WWF para el próximo 1 y 2 de Diciembre en Madrid al que han sido invitados varios miembros del Comité de Cogestión

Sesión de control de la CP de 14 de diciembre de 2016

Sesión ordinaria de la CP en la que además del panel de control se tratan los temas de gestión habituales. Cabe destacar los siguientes:

- Se presentan los datos de las capturas de sonso, tanto de noviembre como del resto del año. En el conjunto de los puertos, en el mes de noviembre no se ha llegado al 75% que marca el punto de referencia de alerta, quedando las capturas al 74% de la cuota.
- Se prepara la campaña de pesca de llengüeta que se iniciará el próximo 16 de diciembre con el siguiente reparto de las capturas:
    - Llengüeta rosa (*Aphia minuta*). Mantenimiento de la pesca de esta especie por las dos barcas que ya lo estaban haciendo (NURIA y TRASMALLERO) con un reparto del 50% de la cuota entre las dos (900 Kg por embarcación), tal y como se hacía hasta ahora.
    - Llengüeta blanca (*Crystallogobius linearis*). Apertura de la pesquería a las embarcaciones interesadas de la zona norte.

- El representante del sector de Girona manifiesta que no encuentra justo el hecho de que ellos no puedan ir a pescar la llengüeta rosa (problema que ha declarado que se eliminaría haciendo cambios en los acuerdos de movilidad), El sector de Girona acepta la posibilidad de la pesca del llengüeta blanca si todas las embarcaciones que quieran se puedan añadir al censo y si el reparto de la cuota no se hace por barca, ya que puede que haya barcos que apunten pero luego no vayan y, en este caso, se desperdiciaría mucha de la cuota asignada a estas embarcaciones.

Las barcas interesadas en la pesca de la llengüeta blanca y el sector pesquero implicado declara que el listado de barcos interesados es el siguiente:

NURIA, BA-2-3064
CRIS-U, BA-3-2-92
ESPARTA, BA-3-4-02
LLAMANTO U, BA-3-1-96
MONTSERRAT, BA-3-2103
PAT Y AINA, BA-3-2-96
IMPOSIBLE, BA-3-2.634
MARIA MAR CUATRE, BA-3-1-10
NEUS II, BA-1-1.227
MARLÚ, BA-4-1-93
HERMANOS CAYUELA DOS, BA-5-1-91
NOVA SANT JOAN BA-4-1-00
PARE TRIAS, BA-4-3-01
ROSA DOS, BA-1-1349
REFÍ, BA-4-1499
SANT JOAN TERCERA, BA-4-1-11

Se recuerdan también las cuotas establecidas en la orden AAM/87/2014, de 20 de marzo, por la que se aprueba el Plan de gestión de la sonsera el litoral catalán:

3,8 Tm de llengüeta blanca
1,8 Tm de llengüeta rosa

En cuanto al reparto de la cuota de llengüeta blanca, entienden que hacerlo por barca podría significar una cuota no aprovechada por los buques con actividad en esta pesquería, si el resto de embarcaciones del listado no salen y que, debido a la variabilidad temporal de la especie, cerrar un límite semanal podría no adecuarse tampoco a su dinámica poblacional. Se acuerda finalmente, con carácter general, establecer la cantidad de 380 kg semanales por flota, que podrán ser acumulables si no se llega al tope durante la misma semana, con un máximo de 15 embarcaciones.
Paralelamente, se acuerda iniciar la campaña de llengüeta blanca con un período exploratorio, desde el inicio de la campaña y hasta el 31 de diciembre de 2016, en el que sólo se permitirá la actividad de la pesca en las embarcaciones:

- PARE TRIAS, BA-4-3-01
- NEUS II, BA-1-1.227

Durante este periodo, que tiene por finalidad la de hacer una evaluación inicial de la pesquería para poder reajustar las cuotas establecidas y su reparto en la siguiente reunión de la Comisión Permanente, la cuota pactada será de 100 kg semanales por embarcación.

- El representante de la empresa Ecohydros expone el estudio realizado por esta empresa en el que se ha hecho una campaña acústica sobre los caladeros del sonso durante los meses de agosto y septiembre, con la intención de poder evaluar la biomasa de las poblaciones de sonso en todo el litoral catalán.

Sesión de control de la CP de 17 de enero de 2017

Sesión ordinaria de la CP en la que además del panel de control se tratan los temas de gestión habituales. Cabe destacar los siguientes:

- Resumen de la campaña de sonso de 2016. Se cierra la campaña de pesca de sonso 2016 con los siguientes datos:

    - En diciembre de 2016 se ha alcanzado el 69,6% de la cuota esperada.

    - Durante 2016, en su cómputo general, se ha alcanzado el 88,49% de la cuota esperada, habiéndose capturado 137 Tm de las 154 Tm asignadas por cuota. Las cuotas de sonso asignadas han quedado muy lejos de las máximas disponibles según el plan de gestión (819 Tm).

- Los representantes del sector exponen que a causa de los reducidos beneficios de las últimas campañas de sonso y llengüeta, hay que buscar mecanismos para no tener que mantener amarradas las barcas de sonso durante la veda de diciembre, enero y febrero prevista en el plan de gestión. Si la situación de poca abundancia de sonso y de llengüeta blanca se mantiene será necesario que las barcas del censo puedan dedicarse a las artes menores durante la veda del soso. En general todos los miembros de la CP manifiestan que hay que buscar soluciones aprovechando los reajustes al plan de gestión que hay que hacer durante 2017, a la finalización de su tercer año de vigencia. A tal efecto se acuerda **convocar una reunión extraordinaria para debatir propuestas de modificación y aplicación del plan de gestión para el próximo día 14 de febrero de 2017**. Esta reunión suplirá la sesión de control prevista para el mes de febrero dado que por motivo del paro de la pesquería del sonso se hace innecesaria.

- Resumen del taller sobre pesca sostenible organizado en Madrid por WWF.. En la jornada han participado Lluís Trias(sector), Mauricio Pulido (sector), José Luis García Varas (ONG) y Ángela Seira(Adminsitración), todos miembros de la CP. Se comenta aspectos de algunos de los puntos tratados como es el caso del colapso pesquero y medioambiental en el mar menor (Murcia). Se trataron entre otros temas, la gestión de la pesca en espacios naturales protegidos, herramientas para la gestión de pesquerías pobres en datos, el proceso participativo como herramienta de gestión y se comentaron diferentes planes de gestión como el de la pesca artesanal de Fuerteventura, el del arte de tirada en las Islas Baleares o el mismo plan de gestión de la sonsera. Desde WWF se informa de que importantes pesqueras quieren entrar en el mundo de la cogestión. Uno de estos es el del sector del pulpo de Galicia.

- Primeras Jornadas sobre la Pesca Sostenible en el Mediterráneo. Organizado por el Parque Natural dels Aiguamolls de l'Empordà. Mauricio Pulido informa que participará como ponente en las jornadas. Lo hará como representante del sector de la sonsera de la provincia de Barcelona a la Comisión Permanente del Comité de Cogestión del Plan de Gestión de la Sonsera. Rosario Allué informa que también participará como jefe del Servicio de Recursos Marinos de la DGPAM.

- Informe del análisis preliminar de la estructura genética poblacional del sonso. Se hace un resumen y una lectura de las conclusiones del informe de genética. Se constata la existencia de un marcador genético que permite diferenciar las dos especies, pero el informe considera que hay que buscar nuevos marcadores. Todos los ejemplares analizados menos uno, pertenecían a la especie *cicerellus*. Se ha detectado la existencia de una única población. Hay que seguir trabajando con más muestras y que estas provengan de caladeros más alejados y separados por tramo de costa sin presencia de sonso.

  Sesión de control de la CP de 14 de febrero de 2017

  Sesión extraordinaria de la CP para la revisión del Plan de gestión de la Sonsera a la finalización del tercer año. Desde el mismo momento de la aprobación del Plan de gestión ya se puso de manifiesto algunos cambios que habría que implementar cara a su revisión. No obstante la tarea de la Comisión Permanente y del Pleno del Comité de Cogestión han conseguido resolver algunas de las cuestiones planteadas mediante el desarrollo que el propio plan de gestión autoriza al Director General de Pesca y Asuntos Marítimos y este, por delegación, al Comité de Cogestión. Durante la reunión no se alcanzaron acuerdos concretos sobre puntos a modificar, no obstante quedan pendientes para poder ser implementados a la finalización del Plan vigente. Los aspectos a modificar se resumen en el punto 4 del presente informe.

  Sesión de control de la CP de 14 de marzo de 2017

  Sesión ordinaria de la CP en la que además del panel de control se tratan los temas de gestión habituales. Cabe destacar los siguientes:

  Por Resolución del director general de Pesca y Asuntos Marítimos de 28 de febrero de 2017, el día 1 de marzo de 2017 se inició la campaña 2017 de pesca de sonso. A la espera de los muestreos científicos y de los informes sobre abundancia de sonso que sean facilitados por los pescadores del sector, se otorgan los permisos especiales para la pesca de sonso con sonsera a las embarcaciones del censo, con las mismas cuotas reducidas con que se cerró la campaña 2016. Simultáneamente dos embarcaciones siguen dedicándose exclusivamente a la pesca de llengüeta rosa (*Aphia minuta*).

- El representante del sector de Girona considera que la veda debería haber prolongado un poco más. El hecho es que hay problemas económicos para poder alargarla. Deberían poder dedicarse a alguna otra actividad como la llengüeta rosa.

- El representante de Barcelona, responsable de la valoración de las capturas según notas de primera venta dentro de la CP, comenta que hay ciertos problemas para que algunas barcas alcancen las cuotas y este hecho puede conllevar que, de acuerdo con el Plan de gestión, aunque deban reducirse más. Las normas del plan se establecieron durante una situación de mucha abundancia de capturas y en estos momentos ya no son las adecuadas. La veda debería alargarse un poco más pero debería ser posible el cambio de

modalidad durante esta. La postura del cambio de modalidad es defendida por ambos representantes del sector.

- Los representantes de la Dirección General de Pesca y Asuntos Marítimos comentan que efectivamente las reglas para la valoración de las Capturas por Unidad de Esfuerzo (CPUE) deberían ser diferentes durante el primer mes de campaña. En cuanto a la posibilidad de combinar modalidades los representantes de la Dirección general manifiestan que es obvio que hay un contexto social que lo dificulta y hay que pensar en fórmulas diversas.

- Ante la posibilidad de que no se alcance el 75% o incluso el 50% de la cuota esperada y haya que tomar medidas de reducción o de cierre, se valoran diferentes posibilidades, como que la cuota pueda asociarse a la embarcación y no a la media de las embarcaciones. Para evitar no llegar a la cuota esperada acuerda que a partir del día 20 de marzo y durante al menos dos semanas, la cuota por embarcación y día (de tres tripulantes) será de 500 kg, trabajando, además en semanas alternas.

- El representante de la provincia de Barcelona manifiesta que en el puerto de Arenys de Mar ha observado algunos incumplimientos en el horario de salida de puerto. Considera que pese a existir unas cuotas máximas diarias el sector debe ser respetuoso con el cumplimiento de las medidas técnicas del Plan. La Dirección General de Pesca informada también de incumplimientos relativos a embarcaciones que sin haber salido a la mar han efectuado ventas gracias a la asociación de embarcaciones y también de ventas de exceso de especies acompañantes. Se debate sobre este tema y se acuerda aumentar el control del propio sector para evitarlo. En cualquier caso se trata de situaciones puntuales y de poca magnitud.

- Finalmente la representante de la Administración pesquera del Estado comenta que ha estado buscando alguna solución al problema de los transbordos (cesión de sonso vivo en la mar) y no ve ninguna posibilidad de acuerdo con lo previsto en la normativa europea actual.

Con posterioridad a la sesión de control de 14 de marzo de 2017, fecha en la que se ha considerado transcurrido el periodo de tres años de aplicación del Plan, se han seguido realizándose reuniones de cogestión y aplicando aquellas medidas de gestión que siendo respetuosas con las disposiciones legales del Plan, más se adaptan a criterio de la CP a las necesidades puntuales de la pesquería. Entre estas cabe destacar la sesión de la CP de 8 de junio de 2017 en la que se acordó el protocolo a aplicar en el caso de aquellas embarcaciones del Censo de la sonsera que deseen abandonar temporalmente la modalidad y retornar a la actividad de artes menores para la que tengan autorización base (artes menores, palangre de fondo o aquellas submodalidades para las que dispongan de autorización). Dicho protocolo fue ratificado mediante reunión del Pleno del Comité de cogestión de la misma fecha.

Las condiciones previstas para el cese temporal en el censo de la sonsera y la reincorporación a la modalidad de artes menores son las siguientes:

Ante la posibilidad de que en aplicación de los puntos de referencia previstos en la Orden de aprobación del Plan de Gestión de la Sonsera, deba procederse a un nuevo cierre temporal de la pesquería en los meses próximos, la Comisión Permanente del Comité de Cogestión del Plan de gestión de la Sonsera, en la Sesión de Control de 8 de junio de 2017 propone un nuevo protocolo de gestión de cuotas, que evite que se tenga que llegar nuevamente a esta situación.

El protocolo se basa fundamentalmente en la individualización de las cuotas por embarcación y día, de manera que sea cada embarcación y no el conjunto de la flota quien deba cumplir con los puntos de referencia previstos en el Plan. La aplicación del nuevo protocolo conlleva consecuentemente la disolución automática de todas las asociaciones de embarcaciones hasta ahora vigentes, de manera que cada una de ellas deberá alcanzar la cuota que le corresponda por sí sola.

Este nuevo mecanismo puede conllevar que algunas de las embarcaciones, por incapacidad de alcanzar los objetivos de cuota previstos, tengan que renunciar temporalmente al permiso especial de pesca con sonsera y devolver a la actividad base de artes menores que tenga autorizada. No es probable sin embargo, que esta situación afecte a un número elevado de embarcaciones por lo que creemos que la incorporación a la modalidad alternativa no resultaría traumática para el resto de las flotas.

Atendiendo a las situaciones en las que hasta ahora se podía renunciar o se retiraba de oficio el permiso especial de pesca con sonsera ya las nuevas que se producirían al valorar el cumplimiento de las cuotas individualizadas, se consideran tres supuestos en los que la embarcación podría retornar a la modalidad de artes menores autorizada y que se recogen en el siguiente Protocolo de Movilización de embarcaciones:

1- En el caso de que el Comité de Cogestión a través de la Comisión Permanente, acuerde el cierre de la pesquería en aplicación de los puntos de referencia del Plan o por cualquier otra causa debidamente justificada.

2- Cuando la embarcación no alcance en el cómputo de un mes natural el 50% de la cuota que tenga asignada. En este caso podrá escoger entre las dos siguientes opciones:

> *a. Renunciar al permiso especial de pesca por un período no inferior a 3 meses y volver a la modalidad de artes menores autorizada. La posibilidad de acogerse a esta opción finaliza el día 15 de septiembre de cada año.*
>
> *b. Que se le aplique durante un mes una reducción de cuota del 50% sobre la cuota general establecida y seguidamente el siguiente baremo:*
>
> > *1. Si a la finalización de este primer mes las capturas son inferiores al 50% de las que corresponderían con la cuota reducida al 50%, se le aplicará forzosamente lo previsto en el punto 2 a), aunque sea con posterioridad al 15 de septiembre.*
> >
> > *2. Si al término de este primer mes ha alcanzado unas capturas comprendidas entre el 50% y el 90% de la cuota reducida (al 50%), mantendrá un segundo mes la cuota reducida al 50% sobre la cuota general establecida.*
> >
> > *3. Si a la finalización de este primer mes ha alcanzado unas capturas superiores al 90% de la cuota reducida (al 50%),*

durante el segundo mes se le aplicará una cuota del 75% sobre la cuota general establecida. Si durante este segundo mes alcanza unas capturas superiores al 75% de la cuota reducida al 75%, recuperará el 100% de la cuota general establecida en el inicio del tercer mes.

El baremo anterior se aplicará cíclicamente en los casos en que corresponda.

3- Cuando el armador voluntariamente renuncie al permiso especial de pesca antes de transcurridos dos meses del inicio de la campaña (antes del 30 de abril de cada año). La embarcación no podrá reincorporarse hasta el inicio de campaña del año siguiente (1 de marzo).

Con carácter general las embarcaciones con permiso especial de pesca con sonsera no podrán dedicarse a ningún tipo de actividad pesquera durante el período de veda comprendido entre el 16 de diciembre al 28/29 de febrero. Sin embargo, aquellas embarcaciones que en base a la aplicación de los puntos anteriores hayan retornado a las artes menores con anterioridad a la finalización de la campaña, podrán seguir dedicándose esta actividad hasta el inicio de la nueva campaña (1 de marzo), momento en que deberá haberse establecido por resolución la actividad de dedicación de la embarcación durante la campaña.

El protocolo anterior se aplicará con carácter general. Sin embargo, la Comisión Permanente del CCPGS (o en su caso el propio Comité), en aplicación del modelo de cogestión, se reserva la posibilidad de valorar puntualmente casos concretos que puedan producirse y que requieran una interpretación específica del protocolo.

Visto, que la aplicación del protocolo anterior puede conllevar la baja temporal de alguna de las embarcaciones del censo, la Comisión Permanente ha acordado solicitar informe a la Comisión Europea sobre la posibilidad de que estas embarcaciones pudieran ser sustituidas otros que reuniendo las condiciones previstas en el plan de gestión estuvieran interesadas en incorporarse a la modalidad.

En el momento del cierre de este informe, de las 26 embarcaciones del censo de la sonsera, 10 embarcaciones han abandonado temporalmente la dedicación a la sonsera y 16 mantienen el permiso especial a la espera de que, como es habitual en esta pesquería, los temporales de otoño incrementen la capturabilidad del sonso. El seguimiento científico de la pesquería sigue efectuándose de acuerdo con los protocolos de muestreo y evaluación de datos iniciales.

4. Propuesta de modificaciones al Plan de gestión y puntos a resolver

Los puntos que deberán ser revisados a la finalización del Plan se relacionan seguidamente:

4.1. Modelo de cogestión.

Adaptar el actual mecanismo de cogestión, basado en el Comité de Cogestión del Plan de Gestión de la Modalidad de la Sonsera, que debería haber sido sustituido por el Comité de Cogestión de la Modalidad de la Sonsera previsto en el artículo 2.1 de la Orden AAM/87/2014, de aprobación del Plan.

En este punto cabe comentar que antes de la finalización de 2017 será aprobado el Decreto del Gobierno Autónomo sobre el modelo de Gobernanza de la pesca profesional en Catalunya. Este decreto establece todos los mecanismos para la preparación de los planes de gestión plurianuales y para la determinación de la composición y el funcionamiento de los Comités de Cogestión.

4.2. Gestión del censo.

Posibilidad de que el censo de 26 embarcaciones pueda ser gestionado por parte de la Comunidad Autónoma de forma más eficiente bajo mecanismos socioeconómicos y si la abundancia de sonso es suficiente también desde criterios sociales. El Plan debería prever que el comité de cogestión debe establecer los protocolos de entrada y salida (intercambio) entre la modalidad de la sonsera y la de las artes menores. Posibilidades de renuncia al permiso especial de la sonsera de carácter temporal y/o definitivo.

4.3. Revisión de los criterios para el establecimiento de puntos de referencia.

Dichos criterios están fijados en el artículo 6 de la Orden de aprobación del Plan de gestión. La variabilidad de la presencia/detección de sonso a lo largo del año y también a lo largo de varios años hacen, hoy por hoy, del todo impredecible el conocer la abundancia de estas especies. Durante el periodo de realización del estudio científico previo a la aprobación del Plan y durante el desarrollo de este, el Comité ha tenido que gestionar campañas con tal abundancia de pescado que había que afinar muchísimo para no superar en pocos meses la cuota total prevista para toda la campaña (cuotas de 600 kg/embarcación/día. En otras campañas ha sido necesario establecer cuotas realmente reducidas para evitar la desaparición estacional del sonso (80 kg/embarcación/día). Finalmente durante la temporada 2017 ha sido necesario disolver las asociaciones de embarcaciones para establecer las cuotas fijas para cada una de las unidades del Plan. De esta forma en aplicación de los puntos de referencia solo algunas de las embarcaciones se han visto obligadas a abandonar la actividad y no la totalidad de la flota. Existe mucho desconocimiento todavía sobre el comportamiento de estas especies de peces y por ello debe seguir efectuándose un seguimiento científico cara a la continuidad del Plan. No obstante la CP es consciente de la necesidad de abrir nuevas líneas de investigación vinculadas a la variabilidad de parámetros físicos o químicos de los caladeros que permitan prever el reclutamiento para cada nueva campaña y el esfuerzo que debe ejercerse en cada momento.
Consecuencia de lo anterior es la necesidad de proceder a la revisión de los puntos de referencia previstos en el artículo 6, adaptándolos según la abundancia estacional o anual de las especies objetivo.

4.4. Posibilidad de compartir cuotas.

El artículo 8 de la Orden de aprobación del Plan de gestión establece la posibilidad de establecer asociaciones entre embarcaciones que permiten compartir las cuotas diarias. Esta posibilidad ha sido empleada y ha dado muy buenos resultados en campañas y épocas de gran abundancia de sonso. De esta forma se ha conseguido poder compartir lances y evitar el *slipping* (abrir la parte final de la red para liberar el pescado que se encuentra en su interior sin

embarcarlo en los copos superiores a la cuota diaria) innecesario. En épocas en que el sonso es escaso o de difícil capturabilidad, como durante el inicio de la segunda mitad de 2017, se ha eliminado la posibilidad de la asociación de embarcaciones, de forma que las cuotas deben ser alcanzadas independientemente por cada una de las embarcaciones y en el caso de no serlo se aplican a cada una de ellas los protocolos de reducción según los puntos de referencia previstos.
También habrá que retocar el redactado del artículo 8 ya que actualmente no permite la asociación de embarcaciones entre embarcaciones de puertos distintos. Existe algún caso de puerto base con una única embarcación con permiso especial de la sonsera. El redactado actual del Plan perjudica a estas embarcaciones que ven imposibilitada su capacidad de compartir cuotas.

4.5. Modificación del calendario de embarcaciones autorizadas.

Este es un caso similar al del punto anterior. El Plan de gestión solo autoriza el cambio de calendario entre embarcaciones del mismo puerto. Debería modificarse para permitir el intercambio entre embarcaciones de distintos puertos base.

4.6. Puertos de descarga autorizados.

Durante el periodo de redacción del Plan de gestión, una de las principales preocupaciones del Comité de cogestión, ya constituido, fué el control de la actividad y de las descargas. El comité detecto desde el primer momento de aplicación del Plan una excesiva rigidez en el hecho de que, de acuerdo con el artículo 14, las embarcaciones deberían efectuar la salida y la entrada desde el puerto base autorizado. El concepto de "puerto base" está estrictamente definido en el ordenamiento jurídico local, y el cambió de un puerto base por otro puede comportar varios meses de tramitación. La imposibilidad de comercializar el sonso en un puerto distinto al de la base de la embarcación ha dificultado en ocasiones la gestión del recurso.

4.7. Control de la cuota diaria.

El artículo 7 de la Orden de aprobación del plan de gestión establece unos mecanismos de control de la cuota diaria destinados a evitar picarescas en relación a les posibles excesos de cuota que puedan producirse. Este mecanismo complejo que se ha mostrado muy efectivo, requerirá en el futuro determinados ajustes puntuales en función del volumen de cuotas que deberán ser aplicados según el criterio del Comité de Cogestión, eliminando probablemente el exceso de concreción que actualmente contempla dicho artículo 7 del Plan.

4.8. Transbordos de sonso en la mar para su utilización como cebo vivo en la pesca con anzuelo

La pesca del sonso con sonsera tuvo sus orígenes en la necesidad de dotar de cebo a las embarcaciones artes menores de palangre de fondo. Más

concretamente aún a las que puntual y temporalmente se dedicaban específicamente a la captura del dentón (*Dentex dentex*) con cebo vivo.

Durante la aplicación del presente plan de gestión de la sonsera (concretamente del sonso) se ha producido un cambio sustancial en el patrón de explotación y en general en la naturaleza de la modalidad. La gestión de las capturas ha comportado un incremento muy importante en el precio de primera venta que con carácter general podríamos afirmar que este se ha cuadriplicado en situaciones de abundancia normales y mucho más incluso en momentos de escasez. En tales condiciones de explotación, en las que el precio del kg de sonso puede superar los 20 euros, no resultaría económicamente rentable destinar estas capturas a cebo para la captura de otras.

No obstante lo anterior, y pese a la escasez de capturas de sonso durante los dos últimos años, es necesario prever la posibilidad de que en situaciones de abundancia de sonso (cíclica según la memòria y experiencia de los pescadores y de periodo desconocido hoy por hoy desde el punto de vista científico), pueda destinarse pequeñas cantidades a cebo vivo entre determinadas embarcaciones de artes menores con las que los pescadores de sonso comparten caladero y horarios de pesca. Para que dichas cesiones de cebo vivo puedan ser realmente eficaces deben realizar-se en la mar, inmediatamente después de ser efectuado el lance con la sonsera y ello requiere lo que técnicamente se define como un “trasbordo en la mar”. Pese a que la operación a realizar nada tiene a ver en la práctica con lo que se entiende por un transbordo, conceptualmente debe considerarse como tal. Consecuentemente la operación de cesión de cebo vivo entre embarcaciones choca frontalmente con el artículo 20 del REGLAMENTO (CE) No 1224/2009 DEL CONSEJO de 20 de noviembre de 2009 por el que se establece un régimen comunitario de control para garantizar el cumplimiento de las normas de la política pesquera común, cuya aplicación prácticamente imposibilita la maniobra de cesión.

Cara al futuro del plan de gestión puede ser necesario prever un mecanismo de que posibilite dicha cesión de sonso vivo a embarcaciones de artes menores dedicadas a la pesca de fondo con anzuelo.

5. Justificación científica de la adaptación del plan de gestión y propuestas de modificación del estudio científico asociado

Como anexo al presente informe de actuación del comité de cogestión se incorpora el informe relativo al seguimiento científico asociado al Plan de gestión, herramienta esencial en la toma de decisiones técnicas y en la aplicación de los puntos de referencia. En las conclusiones y recomendaciones de dicho informe científico se recogen además de las justificaciones de decisiones y los acuerdos adoptados por la CP, las propuestas de adaptación del seguimiento científico a las necesidades detectadas.

Barcelona, octubre de 2017

ANEXO. Informe científico

SCIENTIFIC REPORT

supporting the MPBS

(Management Plan for Boat Seine)

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2017

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SUMMARY

Fishes with short lifespan are difficult customers for fisheries management. For years scientists are trying to point out that the biggest spanner(s) which is (are) thrown into the stock-recruitment relationship, are predator-prey relationships which cause huge B-P fluctuations in a myriad of permutations. Granted, environmental factors play a huge role. Therefore, investigations of both important topics are the key.

The present document is the report of three years of implementation of the monitoring plan established in management plan for artisanal fishing with boat seines, locally calles “sonsera”, of Catalonia. The boat seine fishery is carried out by 26 artisanal boats based in 6 fishing ports in the central and northern coast of Catalonia (NW Mediterranean). Fishing boats operate on a daily basis and landings are entirely used for direct human consumption, as the targeted species are highly appreciated in the region.

This document refers to the “sonsera” gear and provided information on the evolution of landings and fishing effort (the unit of effort being fishing days), different aspects of target species biology, boat seine fishing activity and impact on the ecosystem and population dynamics.

The “sonsera” is a net gear based on two long lateral wings and a bag between of the wings including the codend. The dimensions of the gear follow the accorded to the management plan adopted on 27 March 2014 (ORDRE AAM/87/2014).

The "sonsera" is used exclusively for fishing sand eel and gobid species. The sand eel fishing grounds are located very close to the coast (depending on the zone, within 400-600 m from the coast), in shallow waters (6-16 m depth) and with coarse sand sediment. Gobid species are fished in muddy or sandy-muddy bottoms, at 7-12 m depths transparent goby (*Aphia minuta*) in the southern fishing grounds, and at 30-50 m depth crystal goby (*Crystallogobius linearis*) in the northern fishing grounds.

In the case of sand eel information is available for *Gymnammodytes cicerelus* and *Gymnammodytes semisquamatus* (the last only includes the 2% of the total catches). As for the gobid species, information is available for *Aphia minuta*, *Crystallogobius linearis* (landings of this last species are very low). Ferrer’s goby (*Pseudaphya ferreri*) has reported very low catches along the catch series (2002-2017) and no catches in the period April 2012 to now (April 2017).

Three different sources of data over the study period were considered: Official statistics from Fisheries Department of the Generalitat de Catalunya; daily information from fishermen; monthly sampling on board “sonsera” boats.

Length-weight relationships show a weak positive allometry for *G. cicerelus*, and a quasi-isometry for *G. semisquamatus*. In any case the allometry, when present, although statistically significant in many cases is not strong enough to induce big errors in weight calculations.

Gymnammodytes cicerelus reproduction period in the area extends from November to February and at the end of the fishing season in mid-December the population consists of individuals that have attaint the size at first maturity. The size at first maturity of *G. cicerelus* is 7.9 cm TL. *G. semisquamatus* reproduction period extended from December to March-April. Therefore, it is advisable to maintain the timing of the currently implemented closed season, from mid-December to the end of February. The size at first maturity of *G. semisquamatus* is 8.2 cm TL.

The fishery of both of sand eel species cover the northern part of Catalonia, from El Masnou (15 km north of Barcelona) to cape of Creus (near the border with France). However the effort is not evenly distributed. In the southern part the fishing effort shows an almost uninterrupted continuous, particularly between Mataró and Blanes, being the ports of Arenys and Blanes the most active ports. The maximum effort appears to be concentrated between this two ports, in front of the small town of Calella de la Costa. In the northern part the activity is much lower and distributed in patches with large zones without activity.

Sand eel displays large variations in abundance that cannot be explained by the applied fishing effort. During the three years of MP implementation the abundance of the resource has been very low. Notwithstanding, results from the monitoring have provided information that can potentially be useful for the management of the resource. Thus, results have shown a significant linear SSB-R relationship in sand eel. The catches in December at the end of the fishing season will be linked to the catches at the beginning of the following fishing season. Also, SST in December, during the reproduction period, appears to be linked to the catches the following fishing season. Both the catch at the end of the fishing season and temperature during reproduction can be taken as indicators of sand eel abundance and may be of use for one of the most important management decisions, the date of the opening of the fishing season.

The strategy applied for the monitoring of the sand eel fishery seems adequate. It has allowed detecting changes in the resource abundance along the Catalan coast (sand eel decreased more markedly in the northern part); the monthly length distributions allowed identifying the timing and duration of recruitment and, also, allowed following the modal progression along the year.

The analysis of the boat seine catch when targeting sand eel evidenced a high selectivity of the “sonsera”, as the presence of by-catch species can be detected by the echo-sounder, which allows performing selective fishing operations resulting in catches without or with very few non- target species. From the general information of the by-catch study, it should be taken into account that a high % of by-catch species is recorded when the catch of the sonso is low and viceversa, a high capture of sonso shows a low % of by-catch.

From the information collected, it is known that fleet complies with the conditions requested in the MP regarding the prohibition of fishing over *Posidonia* meadows and the amount of by-catch. Therefore, the same strategy will be maintained in the remaining two year of MP implementation.

Regarding gobids fishery, a very limited number of boats targeted gobids (four to six) and for transparent goby only 1 or 2. In the last years, from 2014 to now, only the TAC proposed for transparent goby has been reached, being catches of crystal goby residual.

1. INTRODUCTION AND OBJECTIVES

This document is the report of three years of implementation of the monitoring plan established in management plan for artisanal fishing with boat seines ("sonsera") of Catalonia. The boat seine fishery is carried out by 26 artisanal boats based in 6 fishing ports in the central and northern coast of Catalonia (NW Mediterranean). Fishing boats operate on a daily basis and landings are entirely used for direct human consumption, as the targeted species are highly appreciated in the region.

The "sonsera" is used to catch mainly *Gymnammodytes cicerelus* and some very small amounts of *G. semisquamatus* (known both as "sonso" in Catalan) as well as some small gobids (transparent goby *Aphia minuta*, and occasionally very low amounts of crystal goby *Crystallogobius linearis*). Ferrer's goby (*Pseudoaphia ferreri*) was caught in very low amounts (< 250 kg/year) only until 2012, and there are not registered catches for Ferrer's goby in recent years.

Unlike the North Sea industrial sand eel fishery harvesting hundreds of thousands of tons extensively used in the fish oil and fishmeal industry, the Catalan fishery is based on small-scale boat seiners yielding some hundred tons per fishing season (March to mid-December) and sand eel is sold at the acution for fresh consumption. The highest landings over 2000-2016 were around 800 tons in 2012-2013, period that coincided with the elaboration of the scientific study that was the basis for the definition of the "sonsera" MP. These value was taken as reference to fix the annual TAC for sand eel. The catches of small gobids *Aphia minuta* and *Crystallogbius linearis* were much low, slightly above 1000 kg per year in the case of *Aphia minuta* in the most recent fishing seasons. Crystal goby catches were very variable, from a maximum of 12407 kg in 2003-2004 to a minimum of 63 kg in 2011-2012. After March 2014 fishermen didn't catch any Crystal goby. In the 2016-17 season there is a residual catch of 16 kg in total.

This report is based on the historical data of the fishery over 2000-2016, and on the data collected during the first three years of monitoring of the implementation of the boat seine management plan, March 2014-December 2016. Data collected during this period include i) close monitoring of the daily catch per boat under a special fishing plan based on a precautionary approach (each haul is geo-referenced, and includes data on depth, time and by-catch; information provided by the fishermen through log books specially designed to this aim); and ii) a sampling campaign carried out on board boat seiners (monthly, two-three fishing days), to obtain data on the specific composition of the total catch, length frequency distributions of target and by-catch

species, length-weight measurements, and when possible, target species sex and maturity.

The data colected has dealt with different aspects of target species biology, boat seine fishing activity, impact on the ecosystem and population dynamics. The results include the following topics:

- Target species identification
- Biological parameters for target species: length-weight relationships, growth, maturity stages
- Size distributions at the monthly scale and for the fishing season
- Stock assessment of target species
- Fleet composition and characteristics of the gear
- Geographical distribution of hauls
- Selective activity of the “sonsera”
- By-catch composition, species identification, sizes, amounts and release of alive specimens

The information in this report is the result of the three years of monitoring of the boat seine fishery in the Catalan coast and is a continuation and updating of the information provided in Sánchez *et al.* 2013).The reported period corresponds to the fishing seasons 2014, 2015 and 2016 in the case of the sand eel fishery; and the fishing seasons 2013-2014, 2014-2015, 2015-2016 and 2016-2017 in the case of gobids fishery.

2. DATA COLLECTION

Different sources of data were used for the scientific study

1) Official statistics. Fishing statistics from Fisheries Department of the Generalitat de Catalunya, over the period 2000-2017. Data are available on a daily basis, and include the catch and income from the sale at the auction, by species and vessel, and the fishing port where the catch was landed. These data provided information on the evolution of landings and fishing effort, the unit of effort being fishing days. In the case of sand eel, information is available for the category *Gymnammodytes cicerelus* (which includes the 2% of the *Gymnammodytes semisquamatus*). As for the gobid species, information is available for *Aphia*

minuta and *Crystallogobius linearis* although the landings of this last species are very low.

2) Statistics specific of the monitoring. Every day fishermen must fill in a form with the position of the hauls, depth, catch and by-catch species and time at sea. This information allowed us to know the daily catches, effort and fishing ground as well as composition of the by-catch. The fishing grounds were mapped.

3) Sand eel sampling. Monthly sampling on board “sonsera” boats from 2014 to December 2016 was carried out off the five ports with "sonsera" fleet (Barcelona, Arenys de Mar, Blanes, Sant Feliu de Guíxols, Palamós and L’Estartit) (Table 2.1). Three times a month on 2014 and twice in 2015 and in 2016 one observer on board recorded the information on specific composition of the catches and by-catch, data on the fishing grounds where the boat seine operated (Table 2.2). In the closed season (January and February) only one sampling per month in two ports (Arenys de Mar and Blanes) was carried out in order to obtain samples for the biological study.

Samples of each haul were taken and examined at the ICM laboratory to identify the species and collect data on length frequency distributions, individual length-weight, sex, and maturation, in order to study the life cycle of the target species (determination of growth parameters, duration of the reproduction period, size at first maturity, gonado-somatic index) (Table 2.3). All by-catch was also examined at the laboratoty, including species identification, lengths and weights. Specimens were measured (total length TL) to the nearest half centimetre (cm), and weighed (total weight TW) to the nearest 0.1 g, When gonads were conspicuous they were weighed with a precision of 0.01 g (GNW) To establish the length- weight relationship specimens were measured to the nearest mm and weighed to the nearest 0.01 g.

Table 2.1. Number of vessels of the ”sonsera” fleet and corresponding crew, by port .

Port	Number of vessels	Crew number
L'Estartit	3	7
Palamós	3	8
Sant Feliu de Guíxols	3	9
Blanes	7	21
Arenys de Mar	8	22
Barcelona	2	4
Total	26	71

Table 2.2. Summary of the sand eel sampling with scientific observer on board sonsera boat by month and port during the monitoring of the management plan (fishing days, and in brackets, number of hauls).

	2014	**2015**	**2016**
Arenys de Mar	10 (25)	8 (18)	11 (22)
Blanes	10 (31)	7 (11)	8 (14)
S.F.+Pal+L'Es*	9 (21)	5 (11)	1 (1)
Total	29 (77)	20 (40)	20 (37)

*S.F.+Pal+L'Es= Sant Feliu de Guíxols +Palamós + L'Estartit

Table 2.3. Number of individuals of *Gymnammodytes cicerelus* and *G. semisquamatus* measured during the monitoring period. *G. cicerelus* were subsampled for measurement when necessary, while all specimens of *G. semisquamatus* were measured.

	G. cicerelus	***G. semisquamatus***
2014	11718	1017
2015	6014	291
2016	5204	1114
TOTAL	**22936**	**2422**

4) Gobids sampling was carried out off the 3 ports with sonsera fleet (Barcelona for *A. minuta*, Arenys de Mar and Blanes for *C. linearis*). Twice a month one observer on board collected information on specific composition of the catches and by-catch, data on the fishing grounds where the boat seine operates, vessel and the fishing operation. Samples from each haul were taken and examined at the laboratory to identify the species and collect data on length frequency distributions, individual length-weight and when possible sex, and maturation, in order to study the life cycle of the target species and spatial distribution of the target species. Specimens were measured (total length TL) to the nearest half centimetre (cm), and weighed (total weight TW) to the nearest 0.1 g. To establish the length- weight relationship specimens were measured to the nearest mm and weighed to the nearest 0.01 g.

All by catch was also examined in the lab, including species identification, lengths and weights.

During all the monitored period, from the fishing season 2013-2014 to 2016-2017 (from mid-December to the end of April) transparent goby (*Aphia minuta*) was captured, while crystal goby *Crystallogobius linearis* was fished only in the fishing seasons 2013-2014 and 2016-2017 (Tables 2.4 and 2.5).

Table 2.4. Summary of gobids sampling with scientific observer carried out on board sonsera boat by month and port during the monitoring of the management plan (fishing days, and in brackets, number of hauls). Number on bracket = number of hauls.

	A. minuta	***C. linearis***
2013-2014	3 (8)	4 (12)
2014-2015	3 (9)	
2015-2016	4(16)	
2016-2017	4 (14)	1(1)

Table 2.5. Number of individuals of *Aphia minuta* and *Crystallogobius linearis* measured during the study period (December 2014 - April 2017).

	A. minuta	***C. linearis***
2013-2014	813	1231
2014-2015	1267	
2015-2016	653	
2016-2017	996	106

3. BIOLOGY

3.1. Taxonomy

Gymnammodytes cicerelus (Rafinesque-Schmaltz, 1810)

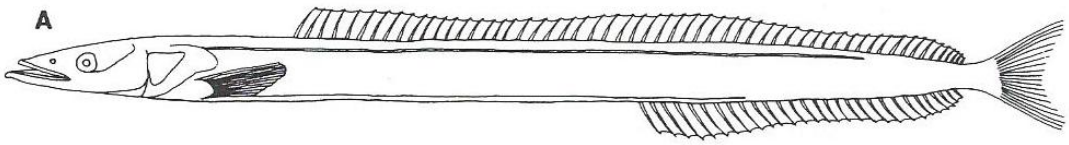


Figure 3.1.1. Adult of *Gymnammodytes cicerelus* from the Catalan coast (from Sabatés *et al*. 1990).

Diagnosis: ventro-lateral skin-folds extending well beyond pectoral fins to anus. Dorsal rays 56-59; anal rays 27-31; pectoral fin ray 12-15. Lateral line branched. Vertebrae 66-67 (mode 66).

Colour: iridescent silver, while the back is bluish-grey and the flanks and belly whitish. In this species it is possible to observe a strip of quit marked dark pigmentation along the top part of the flanks and over the head (Sabatés *et al*. 1990).

Size: to 17 cm SL.

Habitat: inshore to 15 m depth.

Food: probably plankton.

Reproduction: winter spawner.

Distribution: Mediterranean and Black Sea, overlapping with *G. semisquamatus* in the western Mediterranean.

Larvae: Sabatés *et al*. (2003) working on the North of the study area found larvae of *G. cicerelus* in winter (January-March).

Gymnammodytes semisquamatus (Jourdain, 1879)

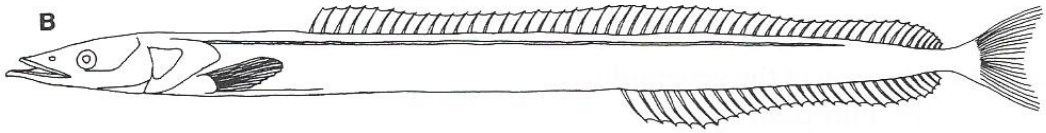


Figure 3.1.2. Adult of *Gymnammodytes semisquamatus* from the Catalan coast (from Sabatés *et al*. 1990).

Diagnosis: ventro-lateral skin folds extend from the base of the pectoral fin to just beyond the rear end of the fin. Dorsal rays 53-59; anal rays 26-32; pectoral fin ray 12-15. Lateral line branched. Vertebrae 64-72.

Colour: Body silver, while the back is dark brown and the flanks and belly whitish. The strip of pigmentation on the flanks is brownish and barely appreciable, though it does exist (Sabatés *et al*. 1990).

Size: to 28 cm SL (Atlantic).

Habitat: typically offshore over shell-gravel, also inshore where shell-gravel beaches occur.

Food: plankton.

Reproduction: summer batch spawner, ripe fish occurring from March to September in North Atlantic, but probably with more restricted spawning periods for each population (Reay 1986) and winter/spring spawner in the Mediterranean (present study).

Distribution: eastern North Atlantic from the southern coast of Norway and the Shetlands (61° N) to Spain (36° N) including all coasts of the British Isles and the North Sea, but not the Baltic, and extending along northern Mediterranean coasts to at least 3° E (Reay 1986; Sabatés *et al*. 1990; Sabatés *et al*. 2003).

Larvae: Sabatés *et al*. (2003) working on the North of the study area found larvae of *G. semisquamatus* in winter (January-March) and few specimens in a 24-h sampling cycle carried out in July.

3.2. Length-weight relationship

Gymnammodytes cicerelus

Length-weight relationships for *G. cicerelus* whole population are given in Figure 3.2.1. Positive allometric growth was observed in this species, with the exception of 2012 which is negative.

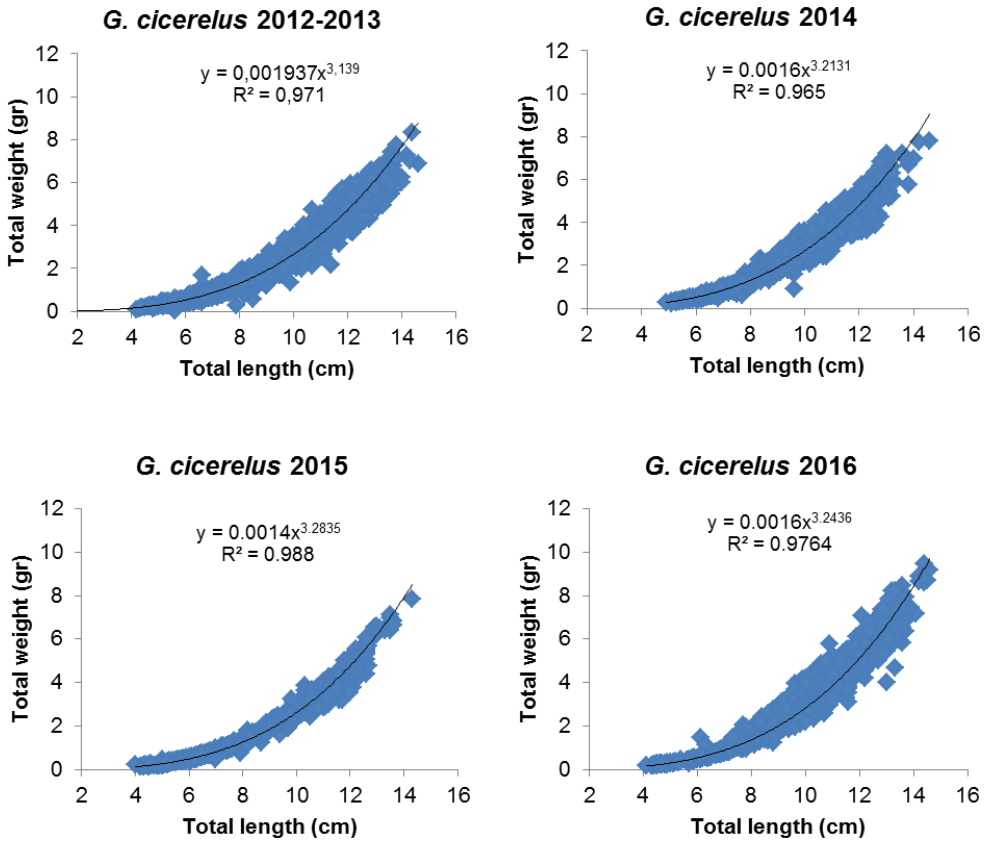


Figure 3.2.1. *G. cicerelus* length-weight relationship (a and b parameters) obtained for the previous study period (2012-2013) and for the present study (2014, 2015, 2016).

Table 3.2.1 Significance test for isometry of the length-weight relationships of *Gymnammodytes cicerelus.* N number of individuals, *b* and *a* length-weight relationship parameters ($w=a \cdot l^b$). p = Probability of *b*=3, and *Vb*=variance of *b*. A significance level of 0.05 is assumed.

	N	*b*	*P*	*a*	*Vb*
2012	2490	2.937	***	0.003181	0.0001139
2013	2236	3.090	***	0.002006	0.0001191
2014	1713	3.213	***	0.001641	0.0001790
2015	991	3.284	***	0.001363	0.0001172
2016	991	3.244	***	0.001617	0.0001509
2017	445	3.108	***	0.001962	0.0003359
TOTAL	8866				

p >	0,05	ns
0.05 > *p* >	0,01	*
0.01 > *p* >	0,001	**
p <	0,001	***

Table 3.2.2. Comparison of slopes (*b*) of the length-weight relationships of *Gymnammodytes cicerelus* among years, all cases appears to be different, except between years 2014 and 2016.

G. cicerelus	2012	2013	2014	2015	2016
2012					
2013	***				
2014	***	***			
2015	***	***	***		
2016	***	***	ns	*	

Gymnammodytes semisquamatus

Length-weight relationships for *G. semisquamatus* whole population are given in Figure 3.2.2. Relative growth appears to be significant allometric positive or negative in different years but 2012 that isisometric.

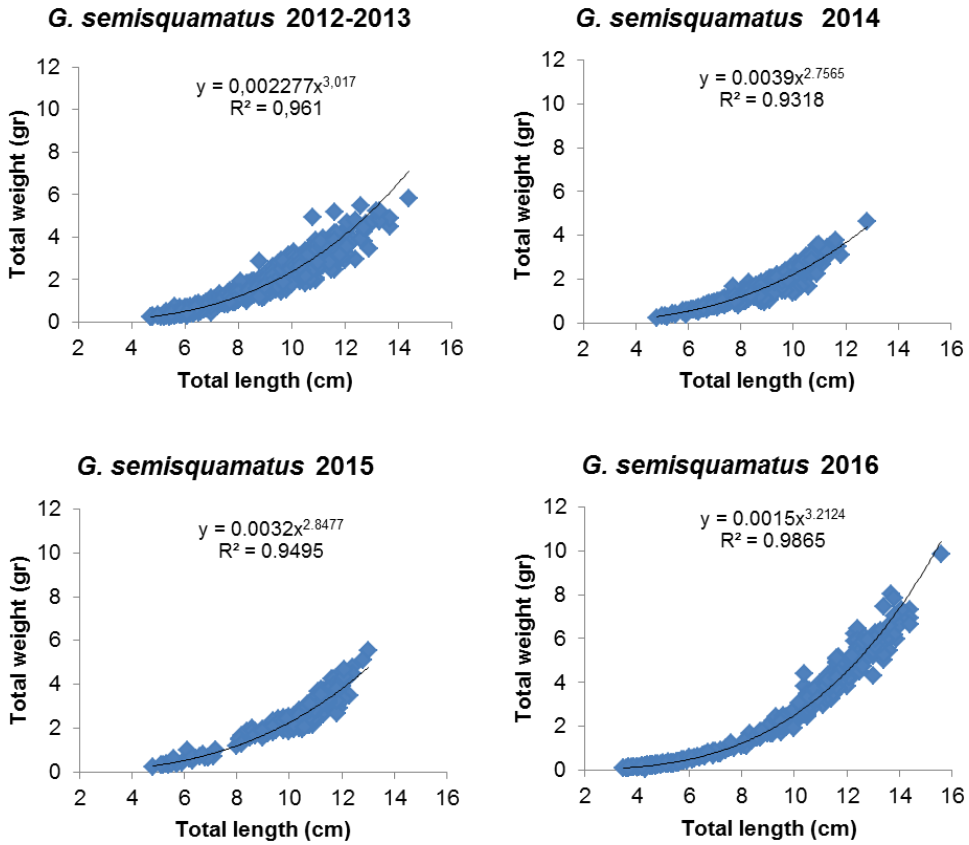


Figure 3.2.2. *G. semisquamatus* length-weight relationship (a and b parameters) obtained for the previous study period (2012-2013) and for the present study (2014, 2015, 2016).

Table 3.2.3. Significance test for isometry of the length-weight relationships of *Gymnammodytes semisquamatus.* N number of individuals, *b* and *a* length-weight relationship parameters ($w=a \cdot l^b$). p = Probability of *b*=3, and *Vb*=variance of *b*. A significance level of 0.05 is assumed.

	N	b	P	a	Vb
2012	957	2.962	ns	0.002565	0.0005361
2013	676	3.058	***	0.002088	0.0002887
2014	534	2.756	***	0.003887	0.0007517
2015	207	2.848	**	0.003209	0.0021047
2016	456	3.212	***	0.001534	0.0003071
2017	163	2.842	*	0.003452	0.0042858
TOTAL	2993				

p >	0,05	ns
0.05 > *p* >	0,01	*
0.01 > *p* >	0,001	**
p <	0,001	***

Table 3.2.4 Comparison of slopes (*b*) of the length-weight relationships of *Gymnammodytes semisquamatus* among years, all cases appears to be different, except between years 2014 and 2015.

G. semisquamatus	2012	2013	2014	2015	2016
2012					
2013	***				
2014	***	***			
2015	*	***	ns		
2016	***	***	***	***	

Some comments on the length-weight relationships

According to the parameters obtained the expected weight at length and year can be calculated. Tables 3.2.1 to 3.2.4 show the following features:

- On allometry
  - length-weight relationships for *G. cicerelus* is allometric for all years. Negative for 2012 (b<3) and positive for the rest of years
  - *G. semisquamatus* appears to be more isometric, but no rule about positive or negative
- Maximum weights
  - The large individuals of both species (more than 10 cm) presented the maximum weight in year 2016

- Smaller individuals (i.e. 5 to 8 cm length) differ according to the species. Maximum weights of *G. cicerelus* occur in 2012, while *G. semisquamatus* presented higher weights in 2017

- Minimum weights
  - Large individuals (>9) appear to be more slender In 2013 for *G. cicerelus* and 2014 for *G. semisquamatus*
  - Small individuals (5-7) present low weight in 2015 for *G. cicerelus* and 2016 for *G. semisquamatus*

G. semisquamatus present the lower weights for the small individuals and the higher weights for large individuals the same year 2016.

	Small individuals	**Large individuals**
G. cicerelus	low weight 2015 high weight 2012	low weight 2013 high weight 2016
G. semisquamatus	low weight 2016 high weight 2017	low weight 2014 high weight 2016

Table 3.2.5. Estimated weights (gr) according to the parameters obtained by species, year and length (cm). Indicated in green and orange the maxima and minima by length.

G. cicerelus	4	5	6	7	8	9	10	11	12	13	14
2012	0.1865	0.3592	0.6136	0.9649	1.4282	2.0184	2.7504	3.6389	4.6983	5.9434	7.3885
2013	0.1454	0.2897	0.5089	0.8193	1.2378	1.7811	2.4664	3.3109	4.3322	5.5477	6.9751
2014	0.1411	0.2891	0.5193	0.8521	1.3087	1.9107	2.6805	3.6410	4.8155	6.2278	7.9022
2015	0.1293	0.2691	0.4897	0.8124	1.2595	1.8543	2.6209	3.5841	4.7695	6.2035	7.9128
2016	0.1451	0.2993	0.5407	0.8915	1.3748	2.0144	2.8351	3.8623	5.1217	6.6401	8.4445
2017	0.1459	0.2920	0.5147	0.8310	1.2586	1.8150	2.5183	3.3867	4.4385	5.6923	7.1669

G. semisquamatus	4	5	6	7	8	9	10	11	12	13	14
2012	0.1558	0.3018	0.5180	0.8177	1.2145	1.7217	2.3523	3.1197	4.0370	5.1173	6.3736
2013	0.1448	0.2865	0.5004	0.8018	1.2061	1.7291	2.3864	3.1939	4.1676	5.3234	6.6774
2014	0.1775	0.3283	0.5427	0.8301	1.1994	1.6595	2.2187	2.8853	3.6674	4.5728	5.6092
2015	0.1663	0.3139	0.5276	0.8183	1.1969	1.6739	2.2596	2.9642	3.7976	4.7699	5.8906
2016	0.1318	0.2699	0.4849	0.7956	1.2217	1.7836	2.5019	3.3982	4.4940	5.8117	7.3738
2017	0.1774	0.3344	0.5613	0.8699	1.2713	1.7766	2.3966	3.1421	4.0234	5.0510	6.2349

3.3. Length frequency

Gymnammodytes cicerelus

The monthly length-frequency distribution in the catches of *G. cicerelus* ranged between 5 and 14.5 cm in 2014, 4 and 14.5 in 2015 and 3 and 14.5 in 2016 with mean size increasing throughout the fishing season from February-March (when the first shoals appeared) until January next year (Figure 3.3.1).

In 2014, the fishing activity was maintained throughout the fishing season, from March to mid-December. Specimens of the whole range of sizes, small, medium and large were caught.

In 2015, the size frequency distribution consisted of small specimens and presence of medium, while the absence of large individuals reflects the closure of the fishing season from July to the December due to the very low abundance of sand eel. Exploratory samples were carried out during the ban of the fishery. In 2016, the scarcity of small specimens and the presence of medium and large specimens, reflects the delay in the beginning of the fishing season to April.

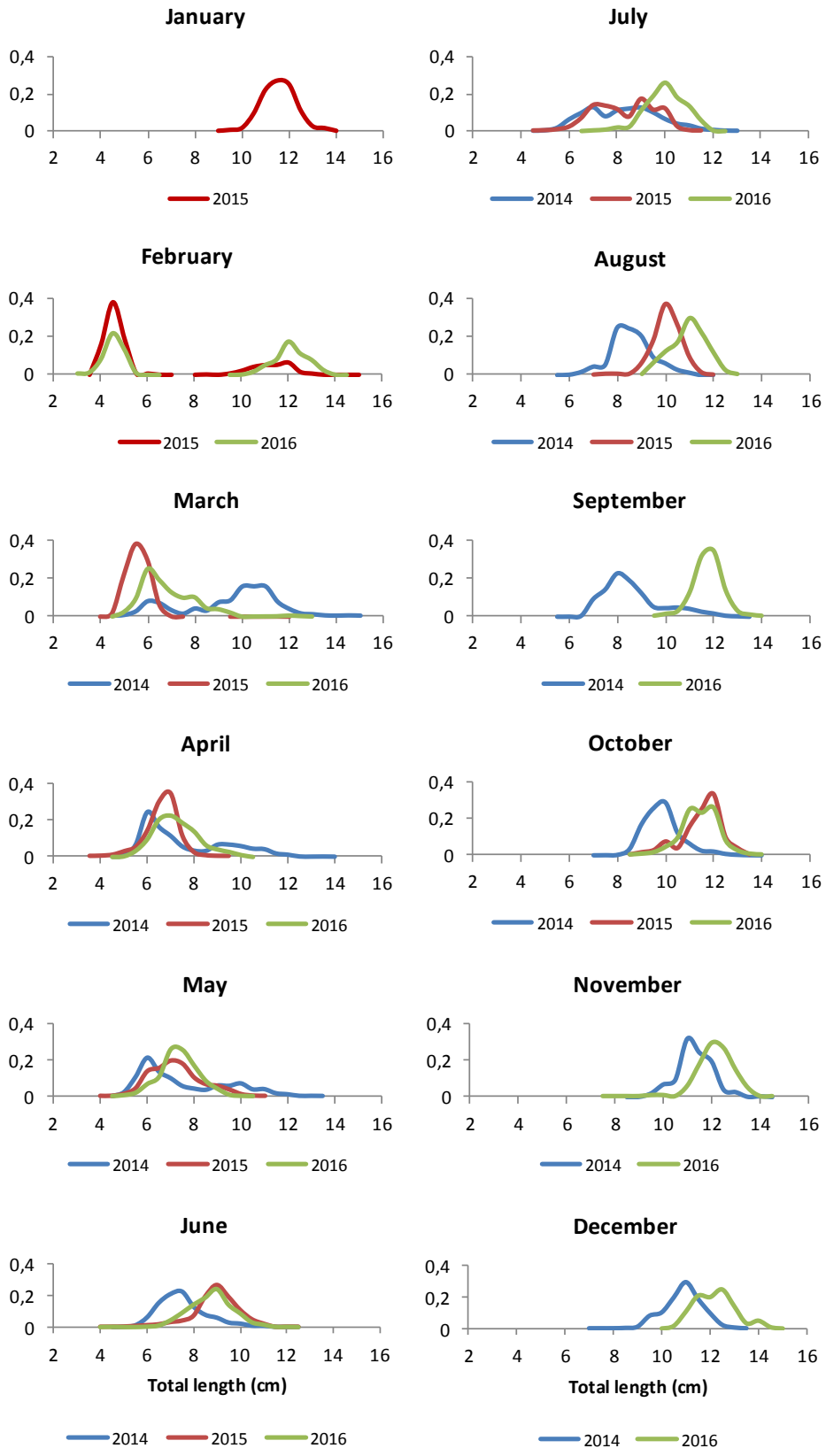


Figure 3.3.1. Monthly length-frequency distribution (2014, 2015, 2016) of *G. cicerelus.* expressed in percentage.

Gymnammodytes semisquamatus

The monthly length-frequency distributions of the catches of *G. semisquamatus* ranged between 3 and 15.5 cm, with mean size increased throughout the fishing season from March-April (when the first shoals appeared) until February next year (Figure 3.2.2). A total of 1017, 291 and 1114 individuals were measured in the years 2014, 2015 and 2016 respectively.

The distribution of sizes was very different in the three years sampled. In 2015 the majority of individuals were large and very few small, in 2016 the situation was the opposite, with more small than large individuals. In 2014, the presence of small and large individuals was detected in a similar proportion.

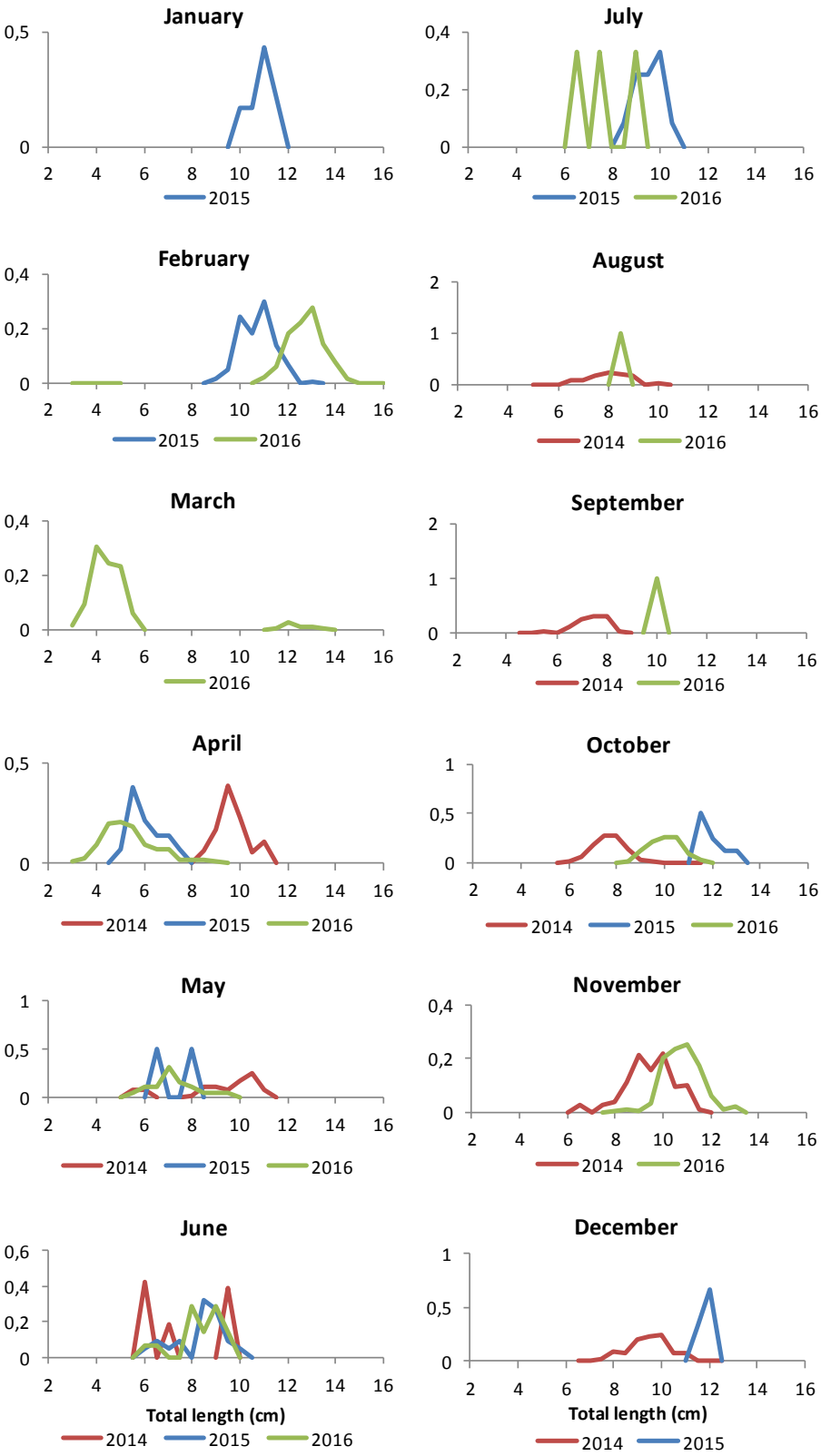


Figure 3.3.2. Monthly length frequency distribution of *G. semisquamatus* in 2014, 2015 and 2016 expressed in percentage.

3.4. Maturity and reproduction

Of the total specimens, 3152 gonads were removed (2056 *G. cicerelus*; 1096 *G. semisquamatus*), the sex determined, and macroscopically assigned to a gonadal stage based on the six maturity phases scale (I=Immature; II=Resting; III=Developing IV=Advanced Maturation; V=Spawning; VI=Post spawning) (Figure 3.4.1 and Figure 3.4.2). Sex was easily assessed macroscopically in mature individuals. However, gonads from small individuals were indistinguishable macroscopically because ovaries and testes were a small and translucent filament. Fish that were too small to determine their sex or assign a gonadal phase were classified as indeterminate.

Gonads were fixed in 10% buffered formalin solution, dehydrated in ascending solutions of alcohols and embedded in a methacrylate polymer resin, sectioned at a thickness of 4 µm with a manual microtome, stained with Lee's stain (methylene blue and basic fuchsin), and mounted in a synthetic resin of dibutyl phthalate xylene on microscope slides to observe them macroscopically (Figure 3.4.3 to Figure 3.4.6).

Macroscopic gonadal stage

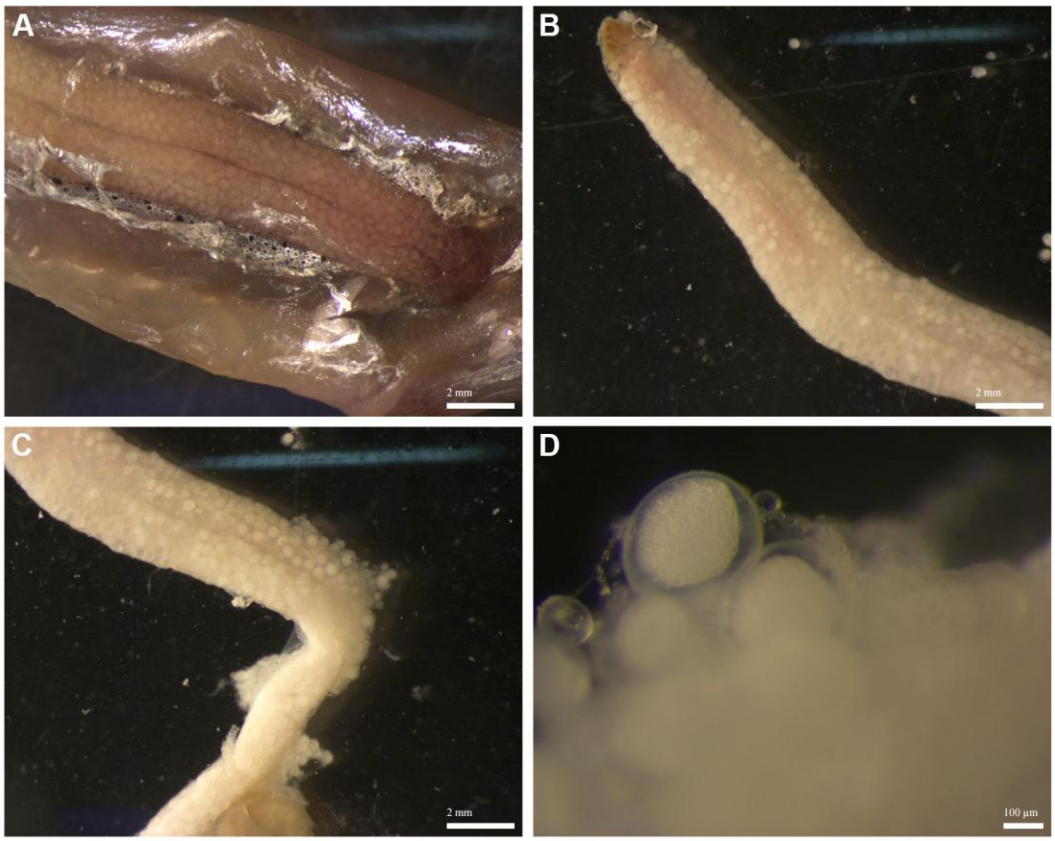


Figure 3.4.1. Macroscopic images of ovaries of females *G. cicerelus* showing different maturity phases: (A) Phase III; (B) Phase IV; (C) Phase V; (D) Phase V with detail of the oocytes.

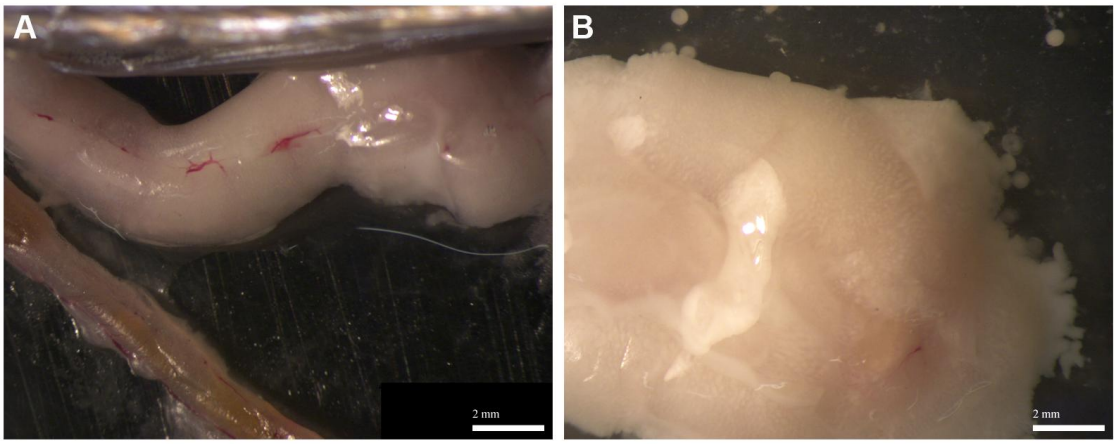


Figure 3.4.2. Macroscopic images of testis of male *G. cicerelus* at maturity Phase V: (A) General view of the gonad; (B) Detail of the testis.

Histological sections

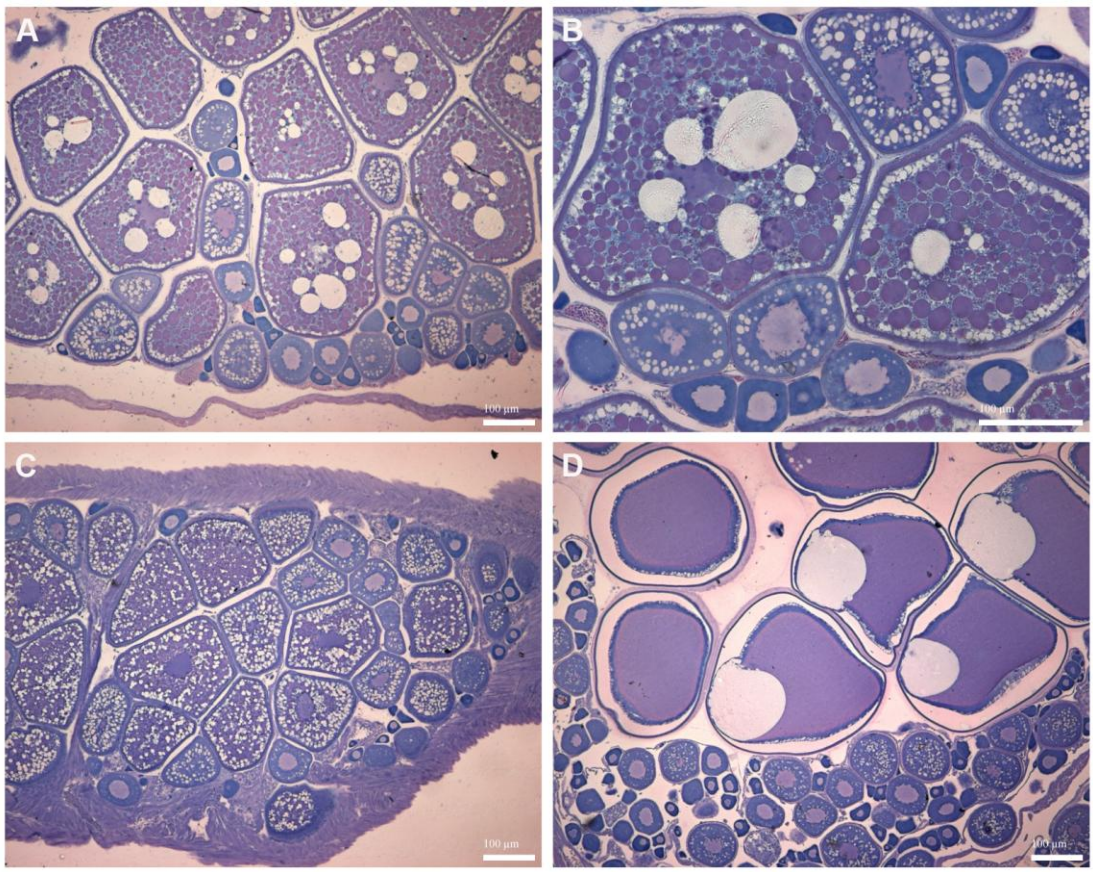


Figure 3.4.3. Histological sections from ovaries of female *G. cicerelus* in mature phases: (A) Advanced Phase IV showing oocytes in different stages of growth; (B) closed-up of a gonad in Phase IV; (C) Initial Phase IV; (D) Phase V showing hydrated oocytes.

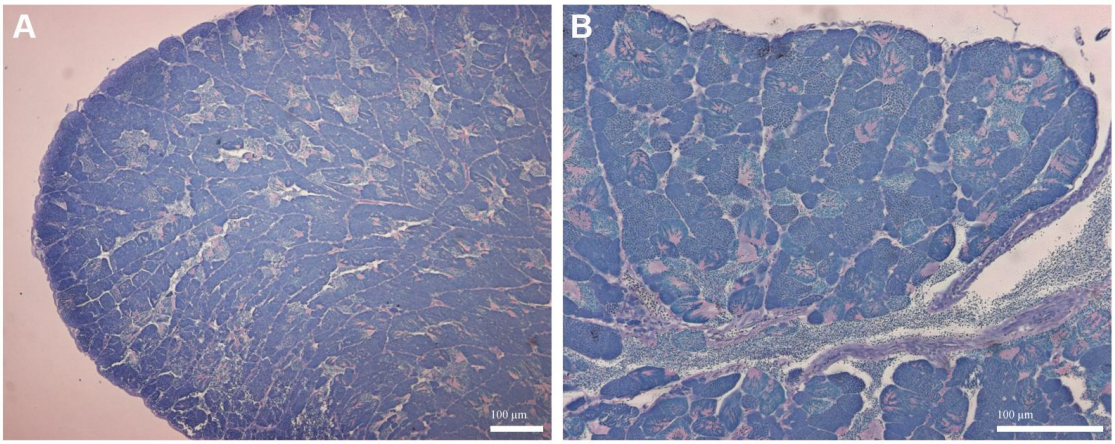


Figure 3.4.4. Transverse section of testes of *G. cicerelus* showing (A) lobular organization; (B) spermatozoa in the lumen of the seminal lobules and in the sperm duct.

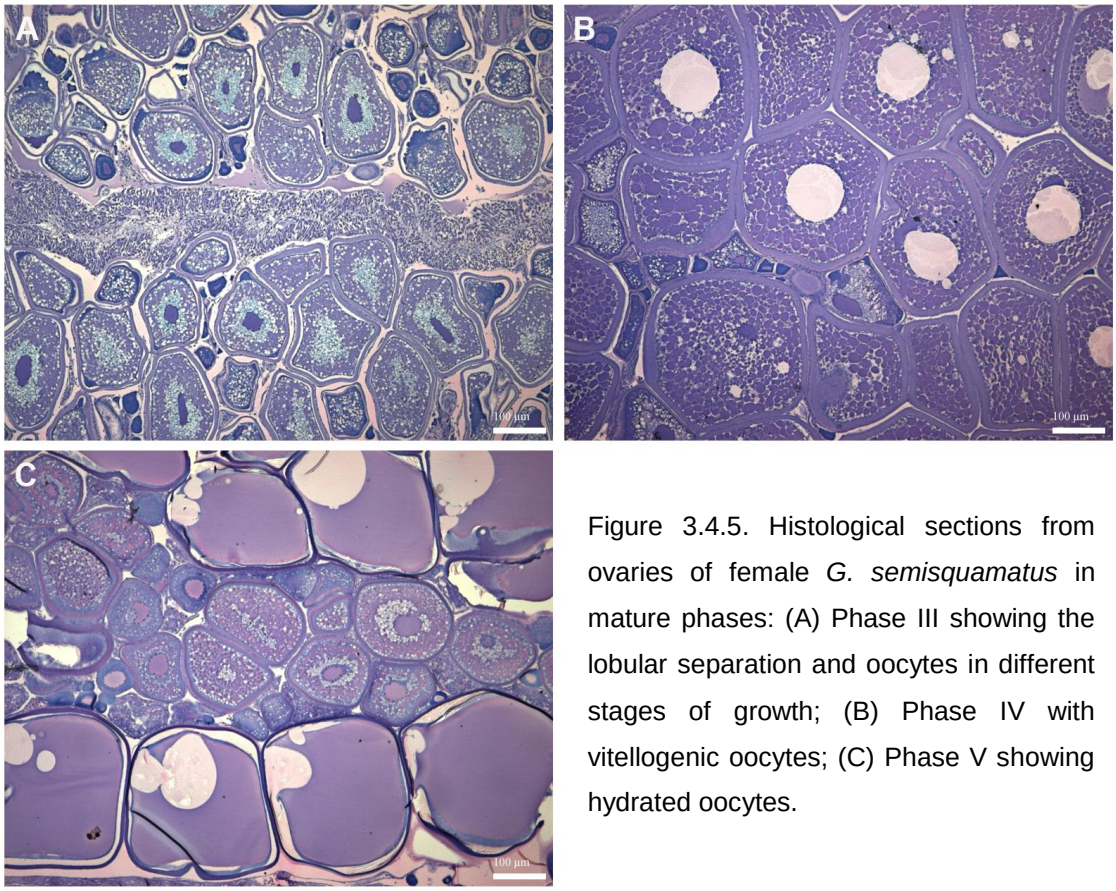


Figure 3.4.5. Histological sections from ovaries of female *G. semisquamatus* in mature phases: (A) Phase III showing the lobular separation and oocytes in different stages of growth; (B) Phase IV with vitellogenic oocytes; (C) Phase V showing hydrated oocytes.

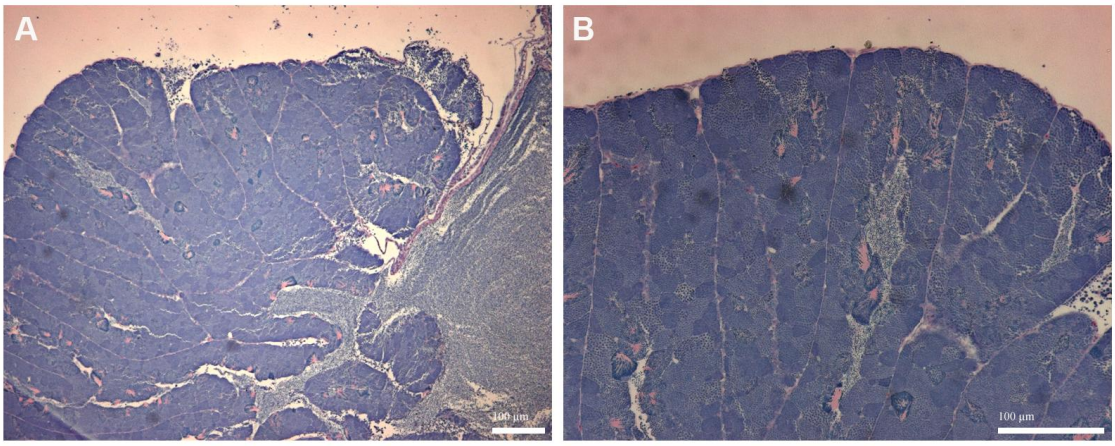


Figure 3.4.6. Transverse section of testes of *G. semisquamatus* showing (A) spermatozoa in the lumen of the seminal lobules and in the sperm duct; (B) lobular organization.

The spawning season was established from the analysis of the monthly variation of the maturity phases and the changes in gonadosomatic (GSI) index for each sex, which was calculated as:

$$GSI = (GNW / TW) \times 100$$

where TW is total weight and GNW gonad weight.

Gymnammodytes cicerelus

Spawning season and size at first maturity

The monthly distribution of the macroscopic classification of the maturity phases (Figures 3.4.7 and 3.4.8) revealed the maximum occurrence of advanced maturation females (Phase IV) from November to March. The presence of spawning females (Phase V) was also observed from November to March, with a maximum peak in January. Females in immature and resting Phases (I and II) were found all the year round except in January. Males showed the same pattern as females, with a maximum peak of individuals in Phase V in December-February.

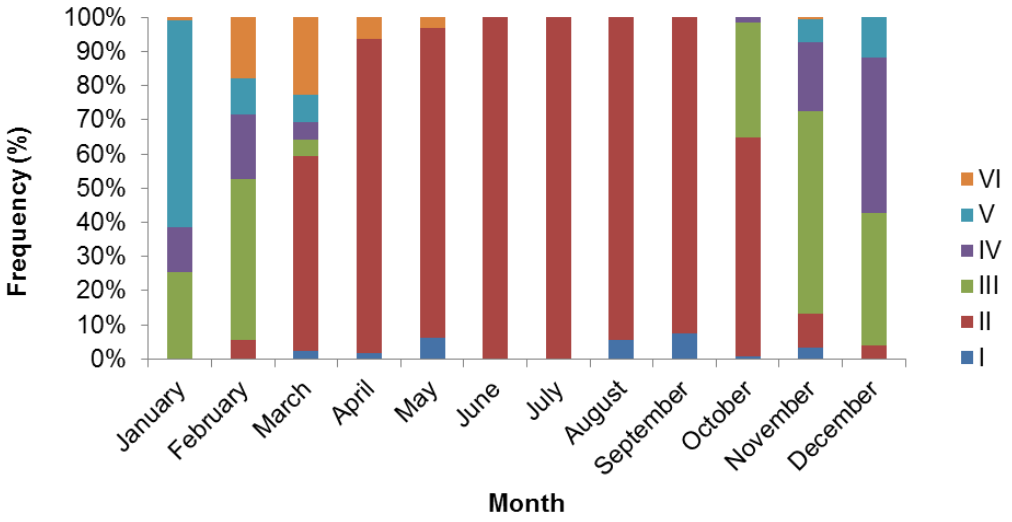


Figure 3.4.7. Monthly distribution of maturity phases for females of *G. cicerelus* (n=1299).

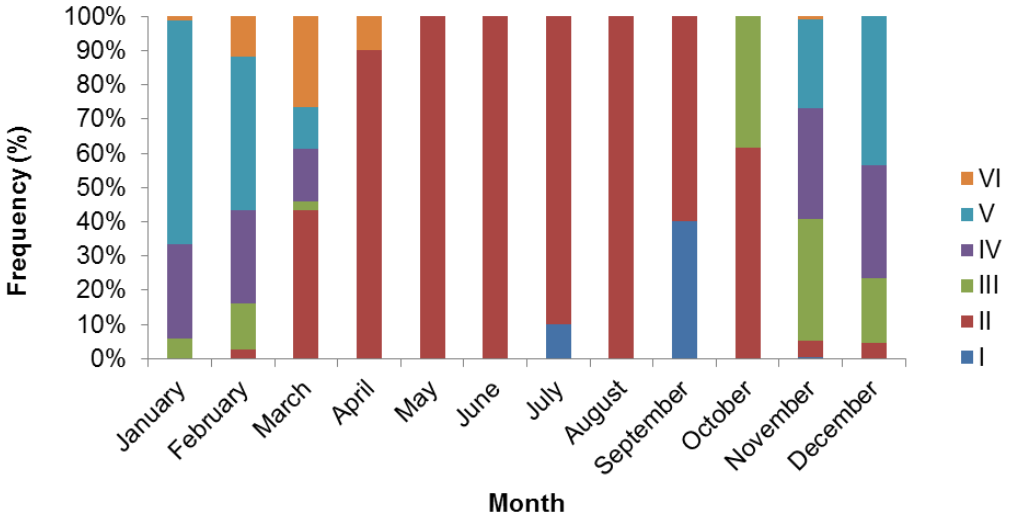


Figure 3.4.8. Monthly distribution of maturity phases for males of *G. cicerelus* (n=757).

Gonadosomatic index (GSI) was calculated for males and females during 2014, 2015 and 2016. The mean GSI for females was highest from November to March, with a peak of maximum activity from December to February (Figure 3.4.9). Gonadosomatic index higher than 7.9 in females and 9.7 in males represent individuals in maturity Phases IV and V. Males showed the same pattern as females.

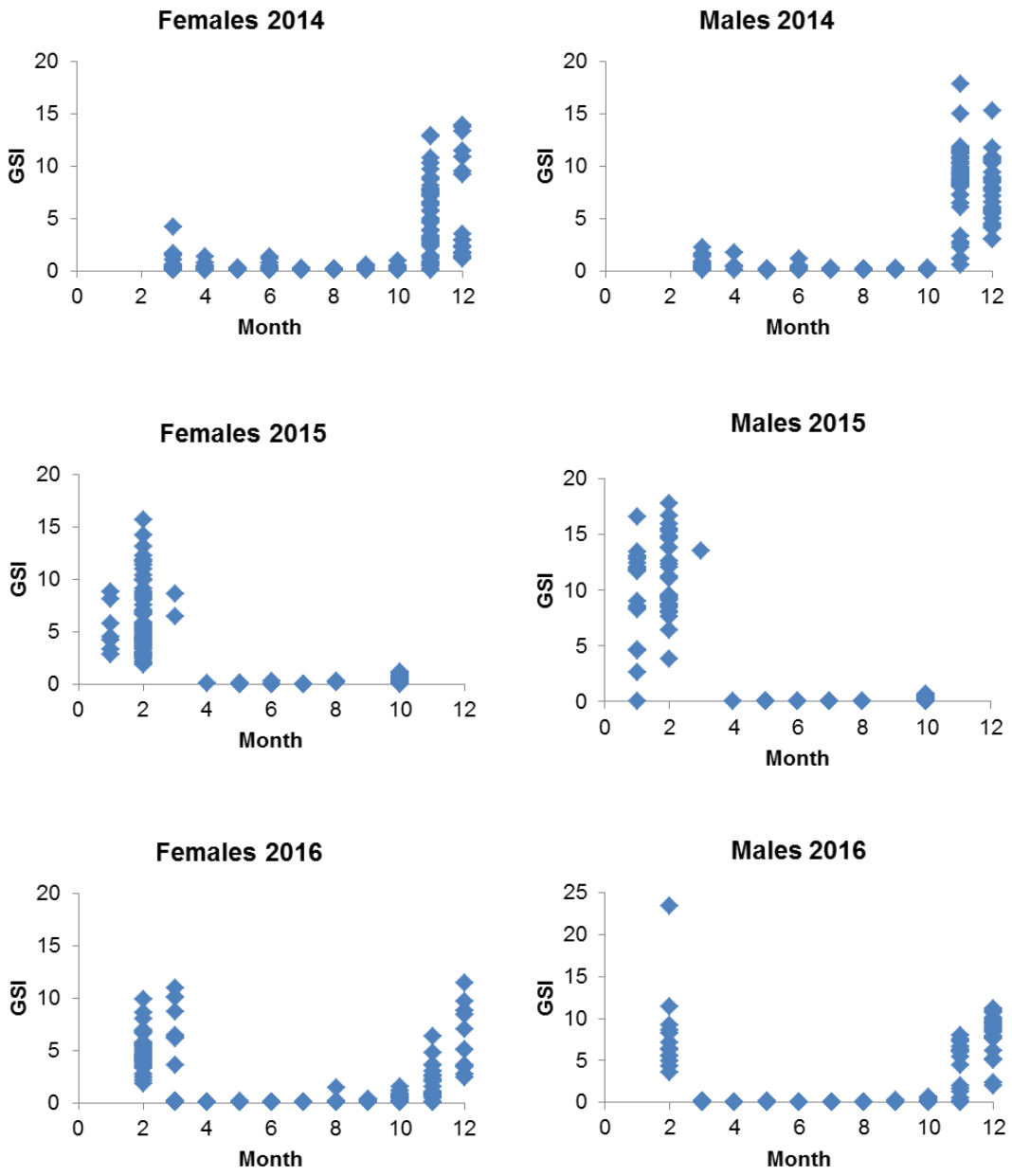


Figure 3.4.9. Monthly changes in the mean gonadosomatic index for females and males of *G. cicerelus.*

The size at-first-maturity (size at which 50% of individuals are mature, usually known as L_{50}) was estimated by fitting the percentage of maturity per length class of 0.5 cm to a log-normal accumulated curve with translation. The adjustment was weighted with the number of observations in each length class from a total of 1624 lectures (Figure 3.4.10).

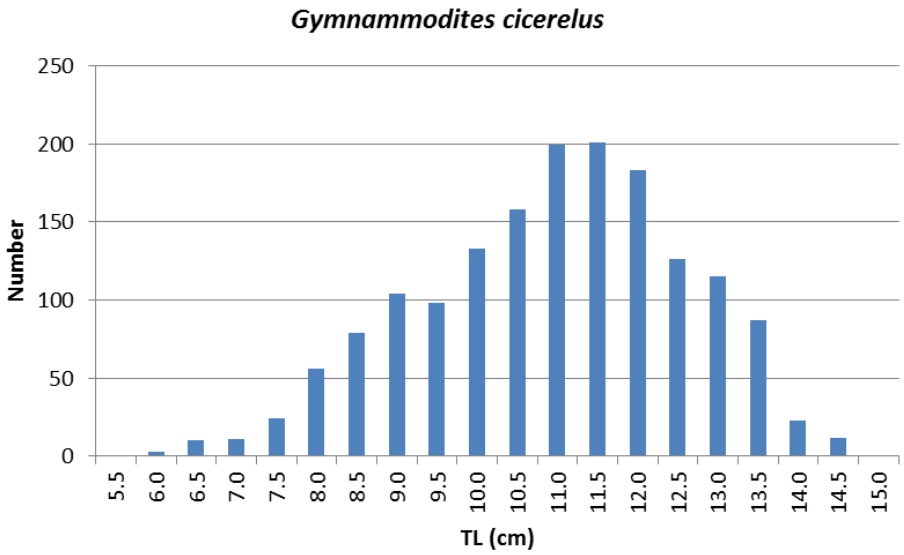


Figure 3.4.10. Maturity sampling for *G. cicerelus*. Number of individuals per 0.5 cm length class.

The results show L_{50}=7.9 cm TL (the log-normal accumulated curve has a translation of 5.3 cm) (Figure 3.4.11).

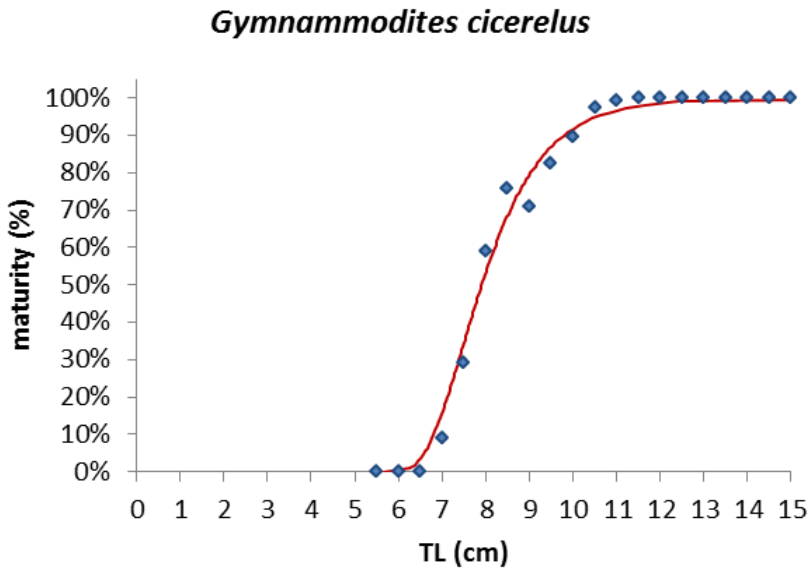


Figure 3.4.11. Maturity ogive for sex combined of *G. cicerelus*.

Gymnammodytes semisquamatus

Spawning season and size at first maturity

The monthly distribution of the macroscopic classification of the maturity phases (Figures 3.4.12 and 3.4.13) showed the maximum occurrence of advanced maturation females (Phase IV) from December to March. The presence of spawning females (Phase V) was observed from December to April, with a peak in March. Females in immature and resting Phases (I and II) were found all year round except in January. Males showed the same pattern as females, with a peak of individuals in phase V in January-February. The smallest mature female and male were 7.2 cm TL and 7.6 cm TL respectively.

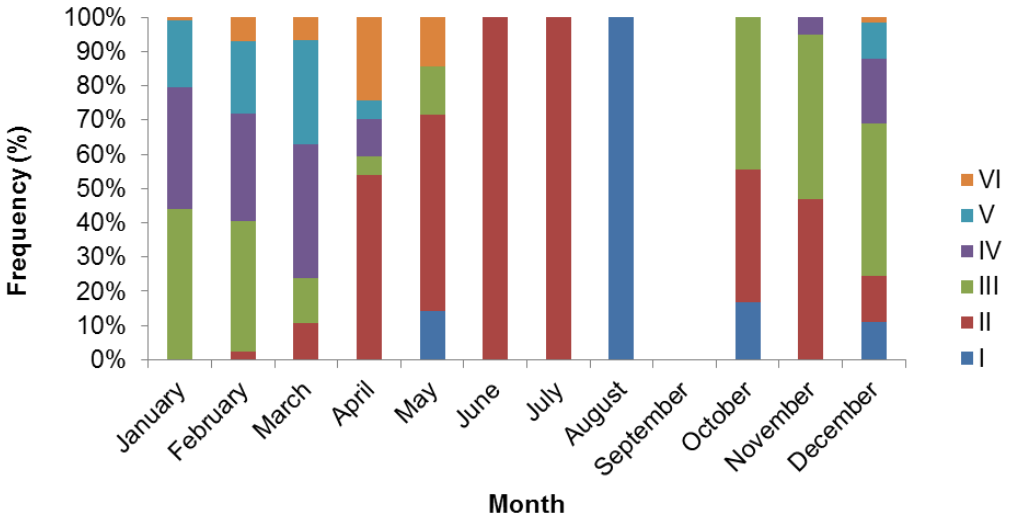


Figure 3.4.12. Monthly distribution of maturity phases for females of *G. semisquamatus* (n=637).

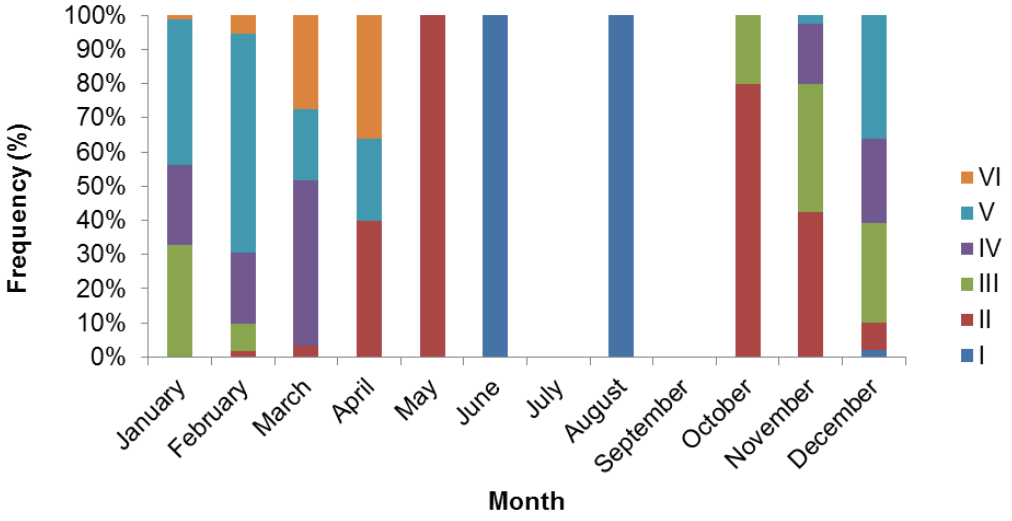


Figure 3.4.13. Monthly distribution of maturity phases for males of *G. semisquamatus* (n=459).

Gonadosomatic index (GSI) was calculated for males and females during 2014, 2015 and 2016. The mean GSI for females was highest from December to March-April, with a peak of maximum activity in December, January and February (Figure 3.4.14). Males showed the same pattern as females. Gonadosomatic index higher than 10.2 in females and 10.5 in males represent individuals in maturity Phases IV and V.

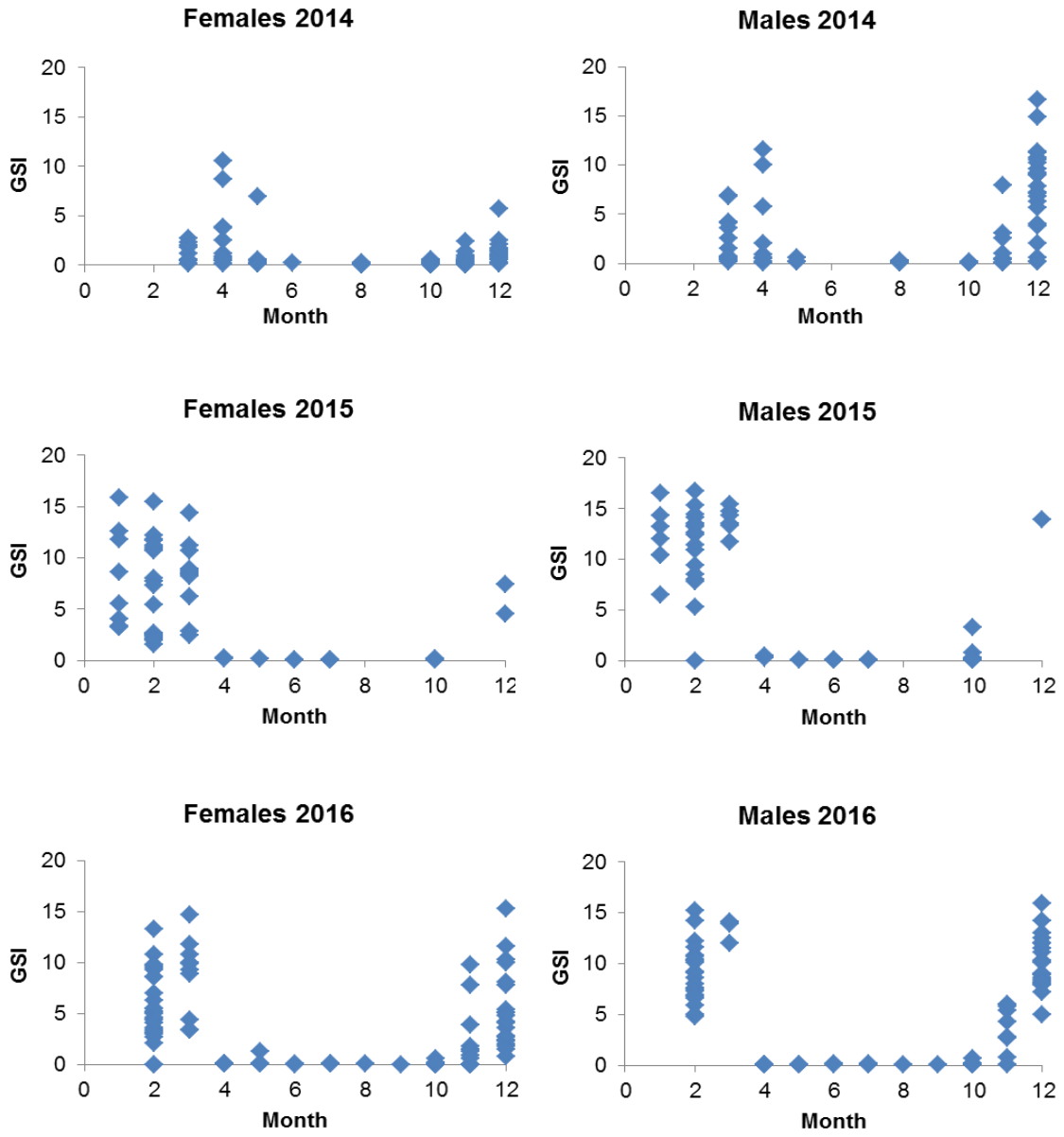


Figure 3.4.14. Monthly changes in the mean gonadosomatic index for females and males of *G. semisquamatus.*

The size at first maturity (size at which 50% of individuals are mature, usually known as L_{50}) was estimated by fitting the percentage of maturity per length class of 0.5 cm to a log-normal accumulated curve with translation. The adjustment was weighted with the number of observations in each length class from a total of 1174 lectures (Figure 3.4.15).

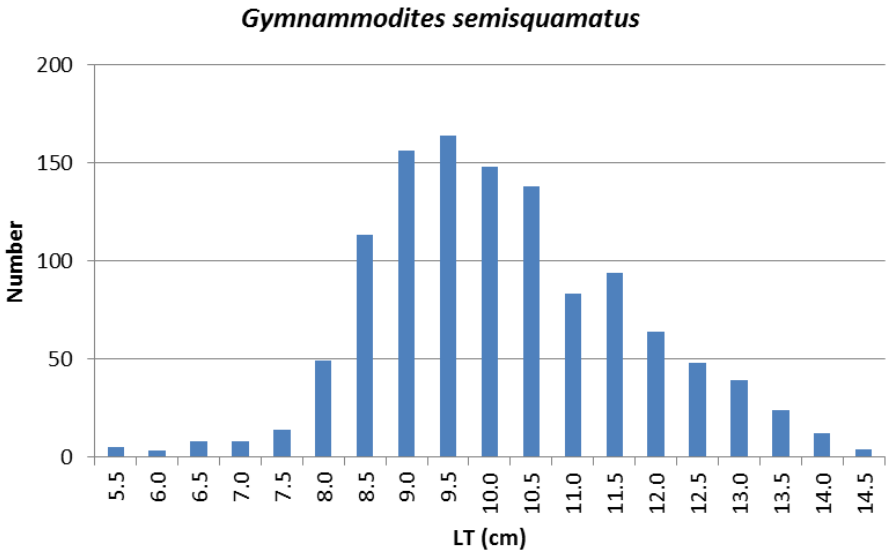


Figure 3.4.15. Maturity sampling for *G. semisquamatus*. Number of individuals per 0.5 cm length class.

The results show L_{50}=8.2 cm TL (the log-normal accumulated curve has a translation of 5.5 cm) (Figure 3.4.16).

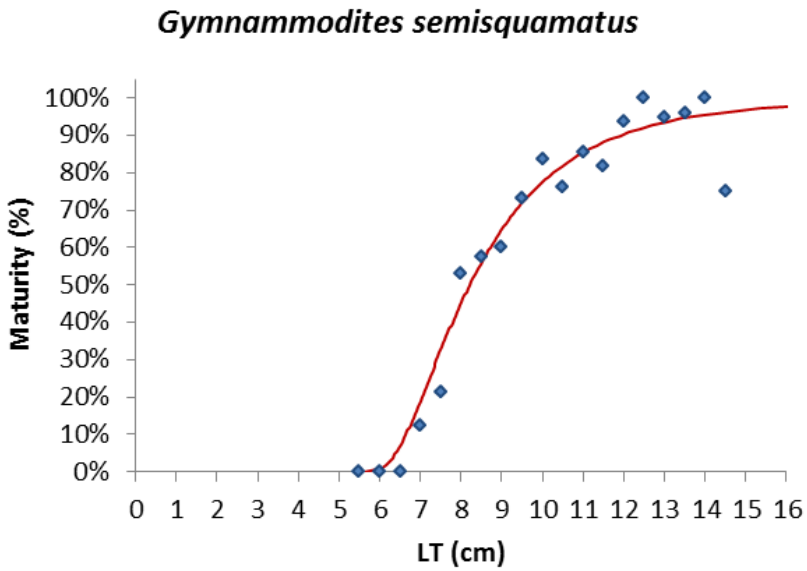


Figure 3.4.16. Maturity ogive for sex combined of *G. semisquamatus*.

4. SAND EEL FISHERY

4.1. Structure of the gear

The “sonsera” is a fishing gear that belongs to the group of boat seine and ir is used for both the sand eel and the “llengüeta” fisheries.

The “sonera” is a net gear based on two long lateral wings and a bag between of the wings including the codend. According to the management plan adopted on 27 March 2014 (ORDRE AAM/87/2014) the dimensions of the gear are:

- Maximum length of wings: 125 m.
- Maximum height of wings: 35 m.
- Maximum length of codend: 30 m.

A rope no longer than 100 m is attached at the end of each wing.

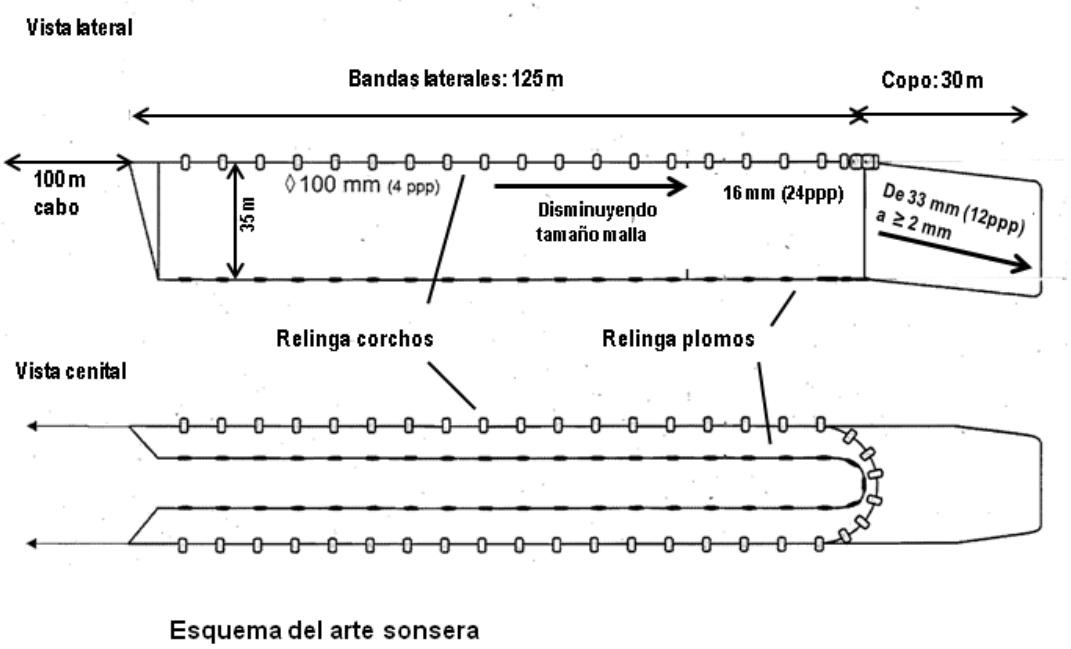


Figure 4.1.1. Drawing of the boat seine “sonsera” characteristics.

The mesh size decreases from the end of the wing (100 mm; 4 Ppp) to the net mouth (16 mm; 24 Ppp). The mesh size of the codend decreases from the mouth (33 mm; 12 Ppp), to its lower white portion of the mesh of the codend (no less than 2 mm; 200 Ppp). A cylindrical net extension is found at one end of the codend and sometimes another extension can be found at the other end. The catch is removed from these

extensions. The above sizes are the minimum ones for the ends of each gear section. However, the wings and the codend constructive characteristics as well as the mesh size configuration may vary according to the habits and customs of each fishermen and net builders.

The wings have a leadline with large number of weights along the net bottom (a maximum of 6 weights per m; maximum 250 g each weight), and a floatline along the top of the net to provide flotation in order to achieve a positive buoyancy during the dropping operation.

Certain variability in the dimension of the “sonsera” previously described is permitted due to the geographic and bathymetric features of the northern sand eel’s distribution area. In this area, between Blanes and L’Estartit, the usual fishing grounds are located between 13 and 16 m, no deeper than 30 m. Therefore, a maximum wing height of 60m and a maximum rope length of 200 m are allowed. Regarding the crystal goby (*Crystalogobius linearis*) fisheries in the northern fishing grounds, a length of 200 m of the rope is also allowed.

4.2. Geographical distribution of effort

From 2012 to 2016 a total of 10872 hauls were recorded from the logbooks. The distribution among years and landing ports is presented in the following table 4.2.1 and figure 2.2.1.

Table 2.2.1 Number of hauls recorded from longbooks from 2012 to 2016 by ports.

	2012	**2013**	**2014**	**2015**	**2016**	**TOTAL**
Barcelona				6		**6**
Badalona				6	29	**35**
Arenys de Mar	1170	1370	1563	503	903	**5509**
Blanes	360	482	721	395	624	**2582**
Sant Feliu de Guíxols	257	346	456	212	303	**1574**
Palamós	111	224	106	162	269	**872**
L’ Estartit	81	107	91	8	7	**294**
TOTAL	**1979**	**2529**	**2937**	**1292**	**2135**	**10872**

In the logbooks, each haul is provided with the geographical coordinates, hence hauls can be represented on the chart. However a number of errors (impossible locations) were detected and corrected (when possible) or removed. The final number was around 10000 (Figure 4.2.2 to 4.2.8).

The table 2.2.1 shows Arenys as the landing port accounting for the half of hauls, this can also be seen in Figure 4.2.1, where the hauls are classified in segments of 3' of latitude. Half of the hauls are placed in the 41°36'N, between Arenys de Mar and Blanes.

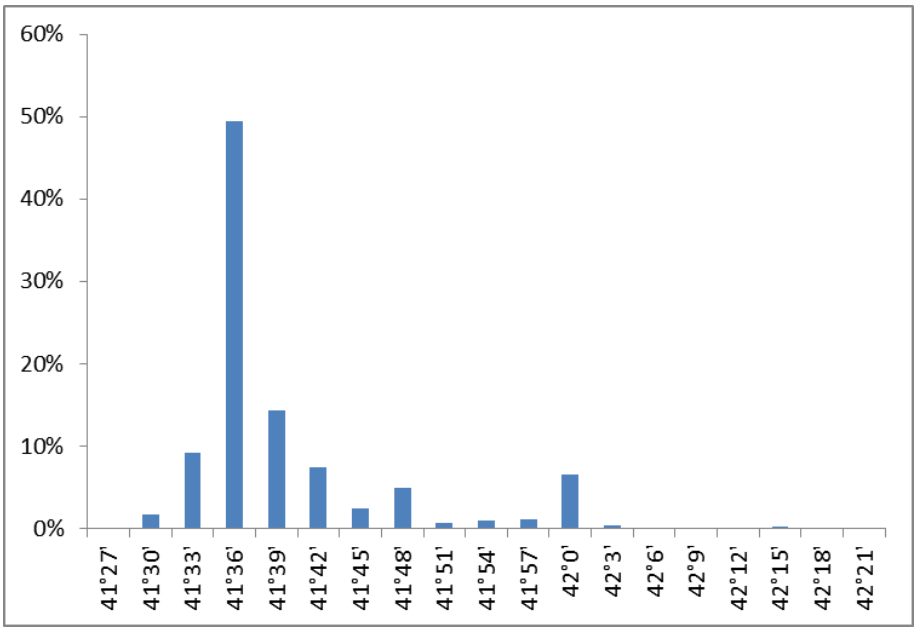


Figure 4.2.1. Percentage of haul by latitude.

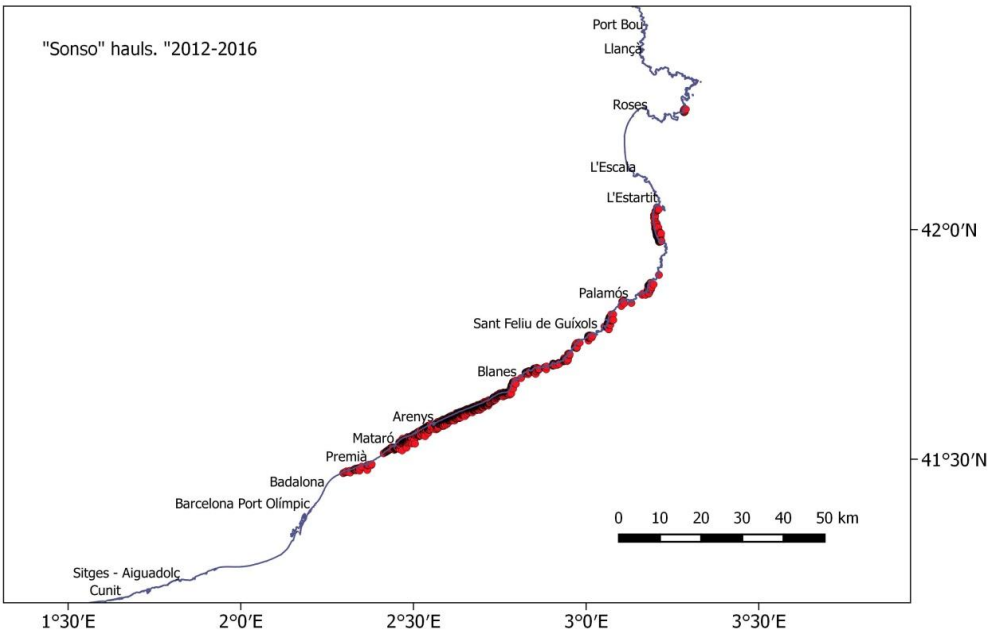


Figure 4.2.2. General chart of geographical distribution of hauls during the whole period.

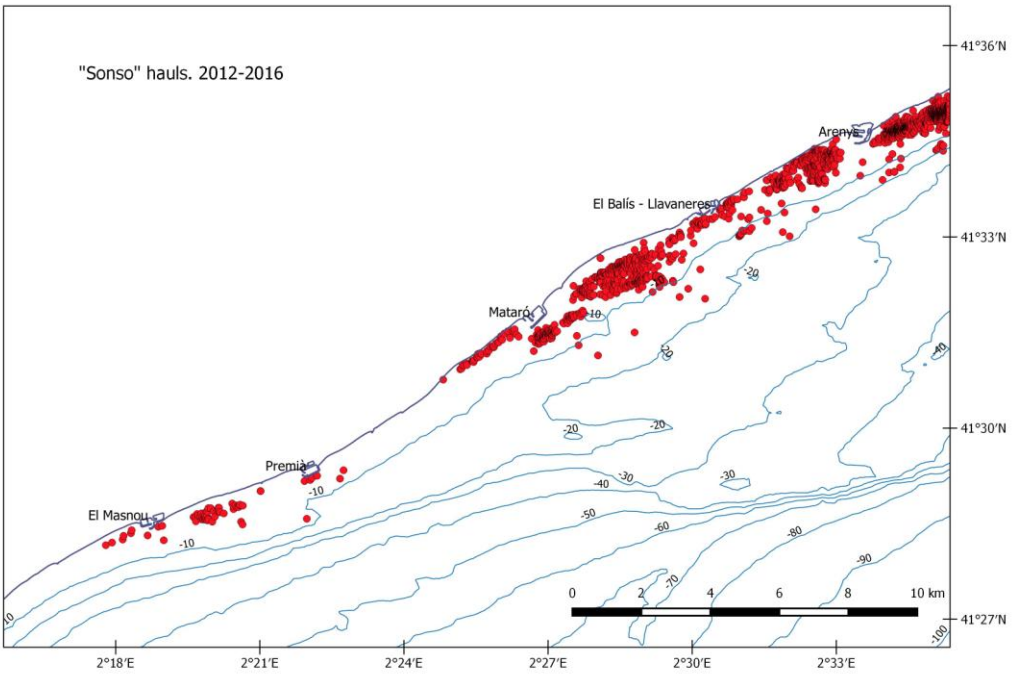


Figure 4.2.3. Detail of the geographical distribution of hauls in the southern extreme of the fishing area distribution (From Mataró to Arenys).

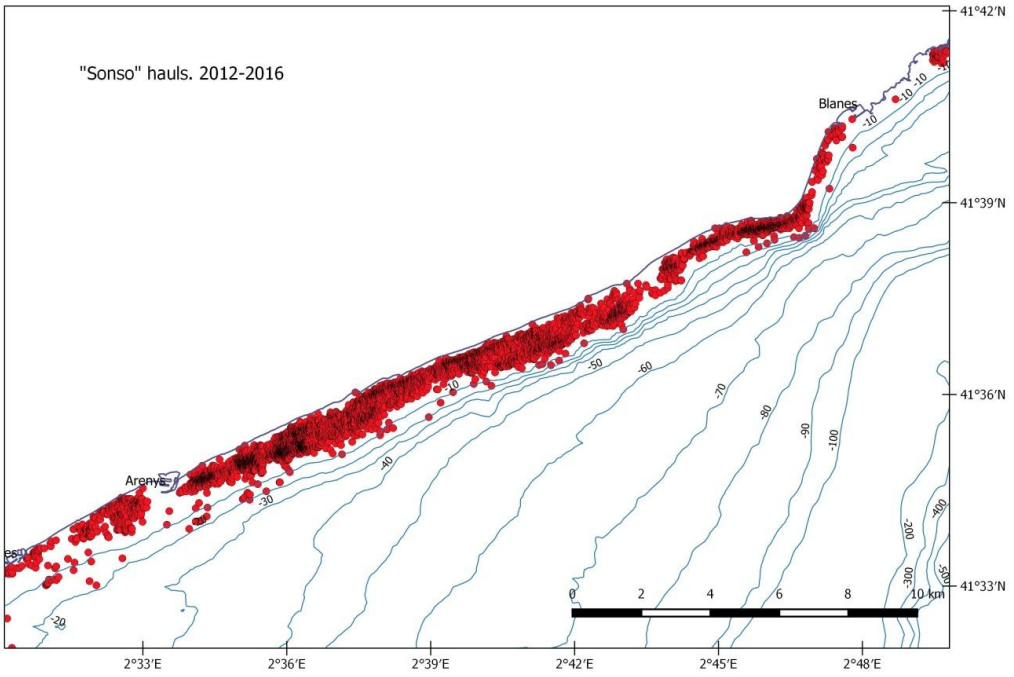


Figure 4.2.4. Detail of the geographical distribution of between Arenys and Blanes. This zone contains the maximum concentration of hauls.

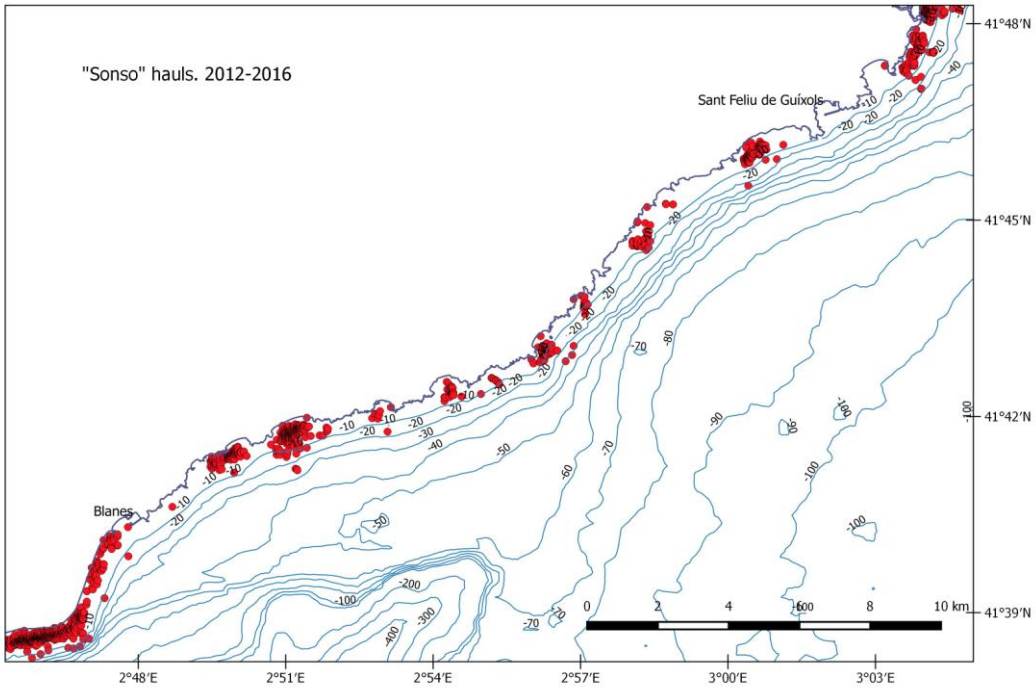


Figure 4.2.5. Detail of the geographical distribution of between Blanes and Sant Feliu de Guíxols.

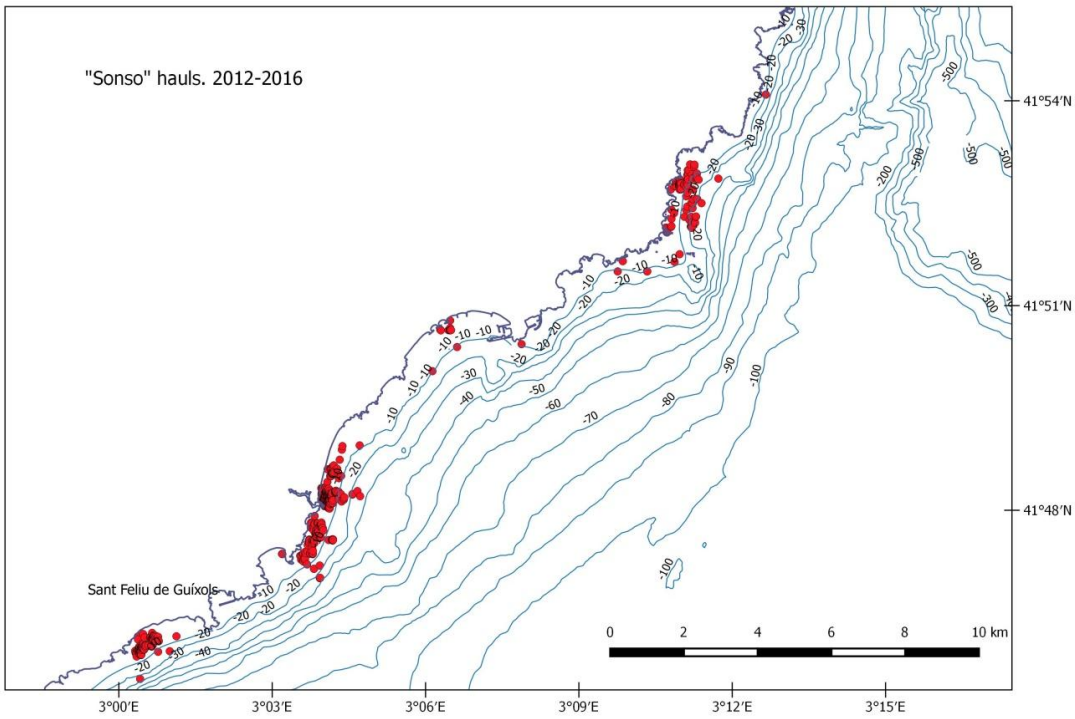


Figure 4.2.6. Detail of the geographical distribution of between Sant Feliu de Guíxols and Palafrugell.

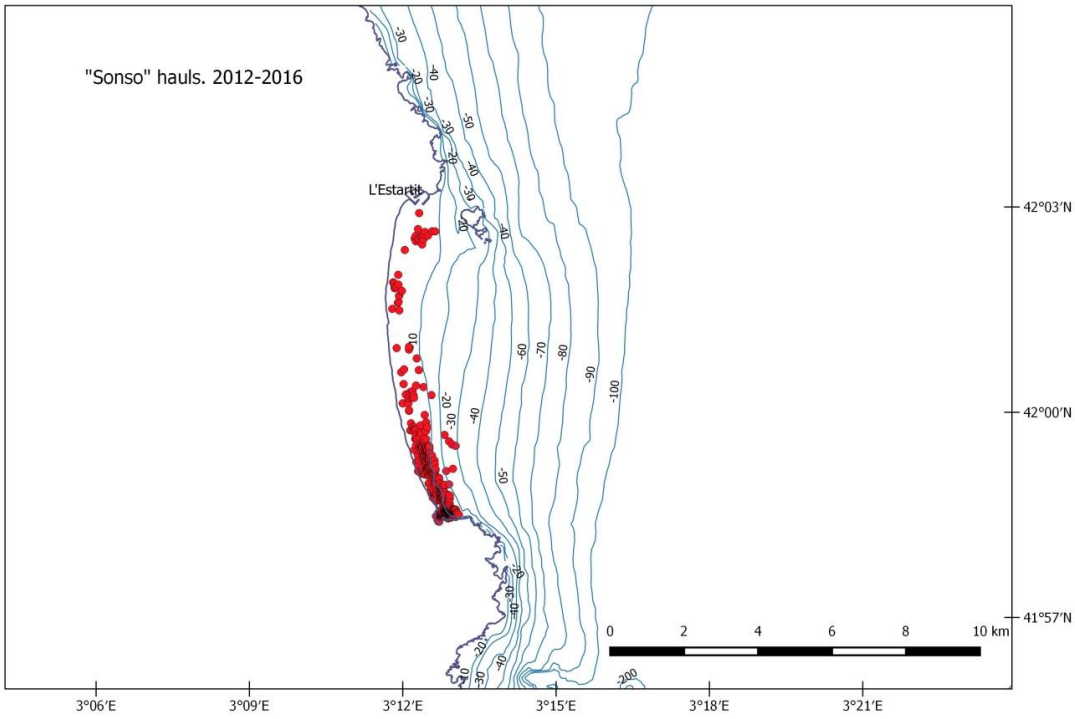


Figure 4.2.7.Detail of the geographical distribution in the beach of Pals.

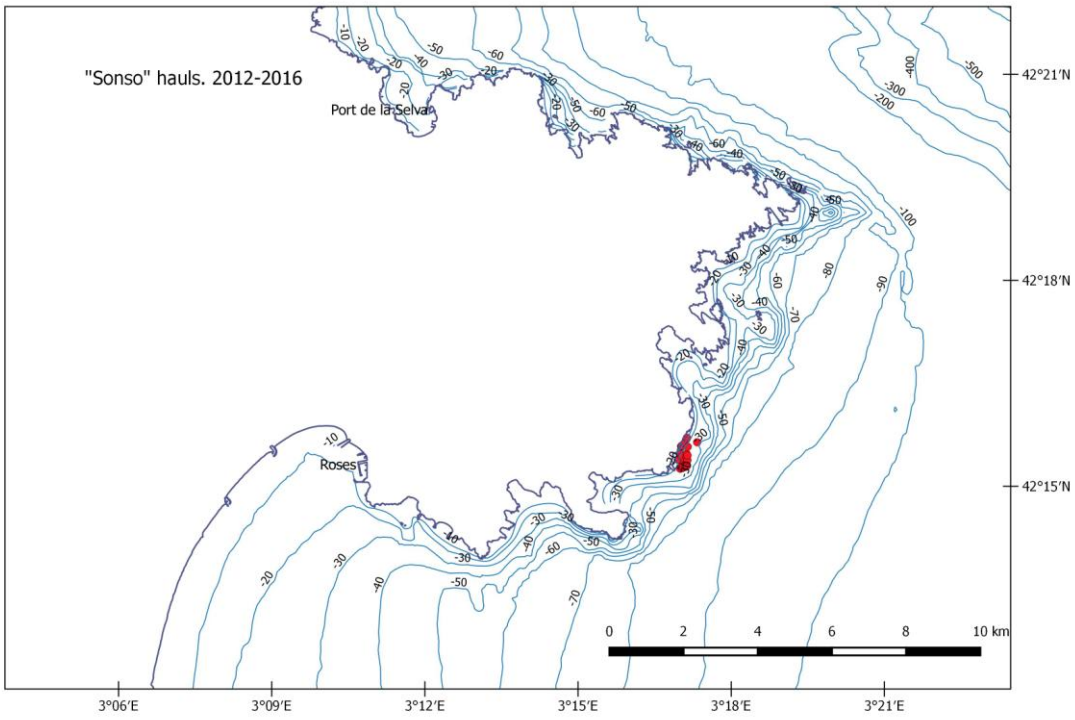


Figure 4.2.8. Detail of the geographical distribution in the cape of Creus (Northern position).

4.3. Sandeel (*Gymnammodytes cicerelus*) fishery in the Catalan Coast: landings, income and fishing activity

Sandeel displayed large variations over 2000-2016 (Figure 4.3.1, upper left panel). The data of the years previous to 2010 were heavily underestimated, as recognised by both, administrators and fishermen**.** The increase of landings since 2010 can be partially explained by an improvement in the control of landings. Nevertheless, landings trend change in 2012, to such an extent that the fishery was closed in July 2015 due to very low catches (Figure 4.3.1, lower left panel). In 2016 landings slightly increased. It is worth noting that since August 2012 a close monitoring of the fishery was implemented, linked to the Management Plan (MP). The overall landings trend seems to point to natural variations in abundance, as fishermen with long experience suggest. At present, as it was historically done, a closed season is implemented from mid-December to March 1st, in coincidence with the species reproduction period.

The total annual income trend was similar to that of the annual landings (Figure 4.3.1, right upper panel). It is worth noting the very low activity of the fleet in 2015, which resulted in a rather low income per vessel from the sale of the sandeel catch at the auction. In 2016, although landings remained low, the income per vessel substantially increased (Table 4.3.1). Despite the boat seine fleet consists of 26 boats, the number of active boats was 23 in 2012 and 2013, and 22 over 2014-2016.

Landings and income by month during the first three years of the MP implementation, 2014-2016, are presented in Table 4.3.2. In 2015 the fishery was closed because of the very low landings and according the control proposed for the MP. The low yield of experimental hauls performed in March 2016 led the fishermen to propose the postponement the opening of the fishing season to April.

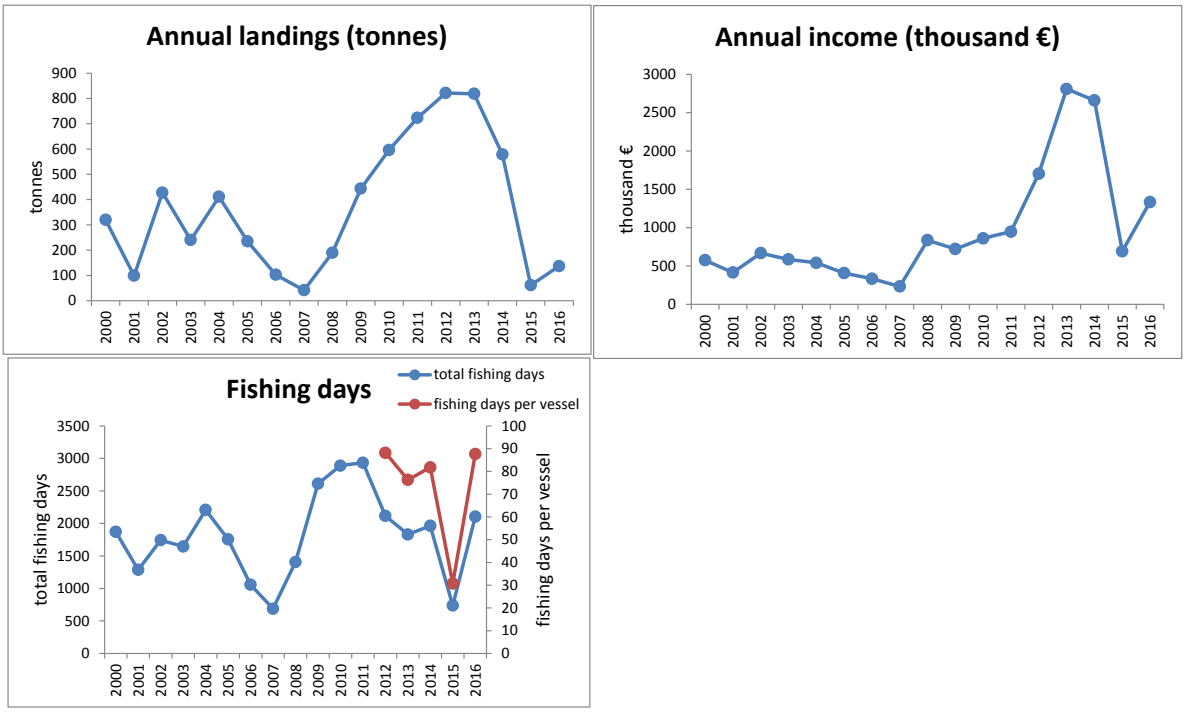


Figure 4.3.1. Sandeel annual landings, income and fishing days (total and by vessel). Input data in Table 4.3.1. Data source: Fisheries statistics of the Generalitat de Catalonia.

Table 4.3.1. Sandeel landings, income, fishing days, CPUE and VPUE. The monitoring of the fishery, that began with the preparation of the management plan and its implementation, started in 2012. Data source: Fisheries statistics of the Generalitat de Catalonia.

	total landings (tonnes)	total fishing days	fishing days per vessel	CPUE kg/day/vessel	total income (thousand €)	VPUE euros/day/vessel	total income per vessel (euros)
2000	320.085	1873			576.156		
2001	98.959	1287			414.853		
2002	427.758	1743			667.469		
2003	240.372	1645			586.637		
2004	411.29	2208			541.256		
2005	235.416	1755			407.336		
2006	102.814	1056			333.818		
2007	41.693	688			233.578		
2008	189.471	1406			836.682		
2009	443.418	2611			721.579		
2010	596.71	2890			861.149		
2011	723.329	2935			947.651		
2012	821.87	2116	92	388	1704.41	805.5	74105
2013	818.61	1831	80	447	2809.326	1534.3	122145
2014	578.517	1963	89	295	2659.764	1354.9	120898
2015	61.459	738	34	83	691.936	937.6	31452
2016	137.015	2103	96	65	1334.008	634.3	60637

Table 4.3.2. Sandeel fishery. Landings and income by month during the first three years of the MP implementation, 2014-2016. Data source: Fisheries statistics of the Generalitat de Catalonia.

Sandeel monthly landings (tonnes)											
	03	04	05	06	07	08	09	10	11	12	total
2014	67.233	64.649	89.026	82.884	126.6	59.61	24.91	36.414	25.023	2.168	578.517
2015	6.715	15.432	21.136	16.264	1.912						61.459
2016		9.156	20.128	19.012	19.519	23.94	16.609	13.104	11.69	3.857	137.015
Sandeel montly income (thousand €)											
	03	04	05	06	07	08	09	10	11	12	total
2014	309.809	342.831	423.739	342.283	441.251	340.929	181.45	155.791	106.543	15.138	2659.76
2015	68.629	183.211	230.649	178.628	30.819						691.936
2016		143.263	293.964	212.732	203.713	207.131	122.057	73.334	56.099	21.715	1334.01

4.4. Assessment

We present an update of the results presented in Sánchez *et al*. (2013) for the period 2014-2016.

Catch and CPUE 2014-2016

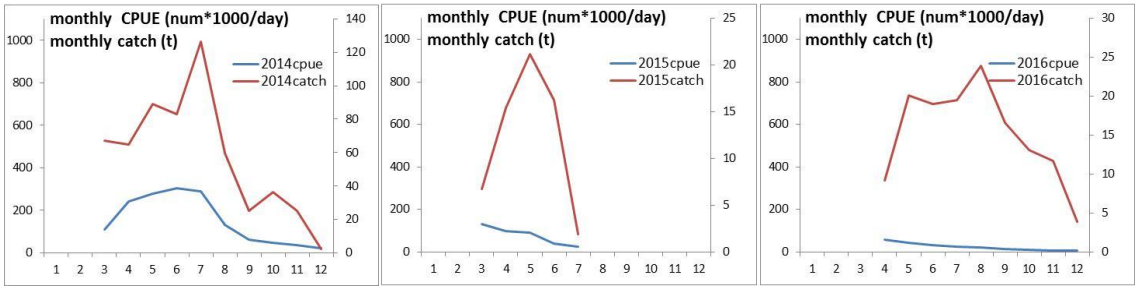


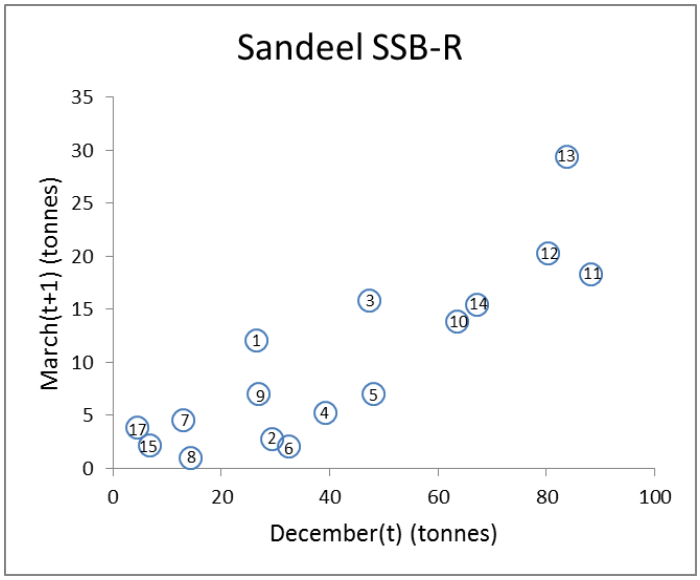
Figure 4.4.1. Monthly CPUE (number of individuals*1000/day per vessel; left axis; the same scale in the three figures) and landings (in t; right axis) over the fishing seasons 2014-2016.

Landings in 2014-2016 underwent marked changes. In these 2014 were still high, reached the minimum in 2015 and displayed a light recovery in 2016 (Figure 4.4.1). The pattern of monthly CPUE evidenced this change in the resource abundance. In July 2015 the fishery was closed and in the following year the start of the fishing season was delayed until April. This change in abundance took place despite the control of the fishing effort and landings in force in the frame of the management plan implementation.

Stock-Recruitment relationship

Stock-Recruitment relationship was explored assuming that catches and CPUE can be taken as proxy for the species abundance. The following questions have been taken into account: most of the recruitment arrives to the ground in February; catches in December consist of individuals that have reached the size at first maturity; and in December, the population is spawning. Accordingly, catches at the end of the fishing season in December (t) were considered as a proxy for the Spawning Stock Biomass; and catches March (t+1) were considered as a proxy for recruitment.

The yield at the start of the fishing (R) was significantly related to the yield at the end of the previous fishing season (SSB; Figure 4.4.2). The sharp landings decrease in 2015 and 2016, 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. The fishing activity, expressed in fishing days, at the beginning and at the end of the fishing season in the period 2000-2017 is shown in Figure 4.4.3. The SSB-R relationship values were very low in December 2014-March 2015 (label 15) and, also, the following year. The lowest value of the series corresponded to December 2007-March 2008 (label 8). In 2007 landings were at their minimum, at a level similar to that registered in 2015 (Figure 4.4.3). Similarly to the landings trend in 2008, the year following the 2007 minimum, in 2016 landings slightly increased in relation to 2015.



	March(t+1)	Dec(t)	label
2000	26.58	12.08	1
2001	29.36	2.81	2
2002	47.42	15.81	3
2003	39.22	5.28	4
2004	48.15	7.03	5
2005	32.48	2.05	6
2006	13.00	4.57	7
2007	14.41	1.01	8
2008	26.86	7.02	9
2009	63.63	13.84	10
2010	88.21	18.26	11
2011	80.31	20.26	12
2012	83.77	29.33	13
2013	67.23	15.43	14
2014	6.72	2.17	15
2015			16
2016	4.50	3.86	17
2017			

Figure 4.4.2. Sandeel SSB-R relationship. Landings at the end of the fishing season in mid-December are taken as a proxy for the spawning stock biomass (SSB), and landings at the opening of the fishing season in March are taken as a proxy for recruitment (R) (significant linear relationship $p<0.01$; input data and labels are shown in the table).

In 2016 the beginning of the fishing season was delayed to April, at the request of the fishing sector, based on the results of the experimental fishing that, in the frame of the monitoring, is carried out when the fishery is closed. In addition, in the previous fishing season, the fishery was closed in July 2015. Consequently, it was not possible to show the SSB-R relationship in 2015-2016 (label 16).

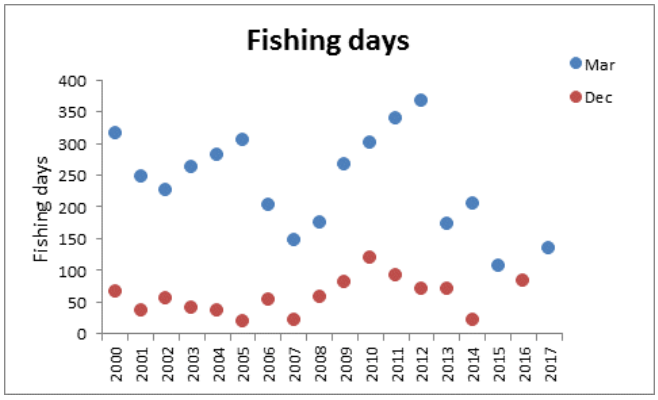


Figure 4.4.3. Activity of the boat seine fleet, expressed in fishing days, at the beginning (March) and at the end (December) of the fishing season over 2000-2017. In 2016 the start of the fishing season was delayed to April (110 fishing days).

Mortalities

Sandeel natural mortality M was extensively explored in Sánchez *et al*. 2013. The considerations there are valid at present. A possible M was proposed around 1.6. In the length cohort analyses presented below, the values considered have been: M=1.6; M=0.66 (Mmean as estimated with Prodbiom; Abella *et al*. 1997); M vector (as estimated with Prodbiom: age0=1.36; age1=0.56; age2=0.40; age3=0.33).

Total mortality Z was calculated with the catch curve and Beverton and Holt methods. The software used was LFDA (Kirkwood *et al*. 2001). The length frequency distributions were organized by 1.0 cm length class. The resulting values were lower than those presented in Sánchez *et al*. 2013 (Table 4.4.1). The highest Z was observed in 2015, year with observed low resource abundance and low fishing yield.

Table 4.4.1. Sandeel total mortality Z as estimated with the catch curve and Beverton and Holt methods.

Method: catch curve			
	1st class included	last class included	Z
2014	5	15	3.6
2015	6	12	6.5
2016	6	15	2.5
Method: Beverton and Holt			
	L' smallest size fullly recruited	Lc mean size from L'	Z
2014	7	8.8	3.4
2015	7	7.5	4.8
2016	8	9.7	2.7

Length- weight relationship

The length-weight relationship was slightly different in the three considered years, 2014 to 2016.

Table 4.4.2. Sandeel. Length - weight relationship parameters.

	a	b
2014	0.0016	3.213
2015	0.0014	3.284
2016	0.0016	3.244

VBGP parameters and age slicing

The growth parameters used in the cohort analyses were taken from Sánchez *et al*. 2013. These are Linf=15.75 and k=0.84.

The 2014 to 2016 length frequencies distributions (Figure 4.4.4 and Table 4.4.3) were transformed into ages using the VIT (Lleonart and Salat 1997) and LFDA software. Size classes were organized in 1.0 cm class interval. The resulting age structures were very similar. The only difference was that a very small number of age 3 individuals were identified in 2014 and 2016 with LFDA, while VIT identified ages 0 to 2 (Table 4.4.4). It is to be noted that the catch consisted of age 0 and 1 individuals, the presence of older ages being very low (Table 4.4.4).

The shape of the length frequencies distributions shows the result of the 2014, 2015 and 2016 fishing seasons (Figure 4.4.4). In 2014 landings were high (Figure 4.4.1) and 9-11 TL individuals were well represented, while in 2015 these sizes were much less abundant, thereby displaying the effect of the closure of the fishery in July, that is, larger individuals are caught as the fishing season advances. In 2016 the opening of the fishery was delayed to April and, hence, the presence of smaller individuals was lower and the larger individuals were relatively more abundant than in 2014, despite the total catch in 2016 was rather lower (137.0 t) than in 2014 (578.5 t).

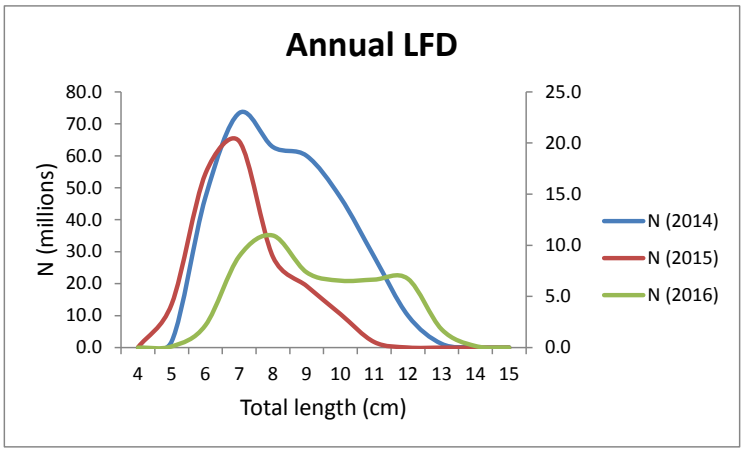


Figure 4.4.4. Sandeel length frequencies distributions over 2014-2016 (Total length in cm; 2014 left axis and 2015-2016 right axis).

Table 4.4.3. Sandeel catch structure by size over 2014-2016 (millions).

Length class		Number caught	Number caught	Number caught
lower	mean	N (2014)	N (2015)	N (2016)
3.5	4	0.000	0.021	0.000
4.5	5	1.963	4.264	0.116
5.5	6	47.098	17.021	2.186
6.5	7	73.367	20.170	8.932
7.5	8	62.741	8.865	10.956
8.5	9	59.969	6.017	7.352
9.5	10	46.970	3.278	6.543
10.5	11	28.421	0.547	6.649
11.5	12	10.020	0.011	6.724
12.5	13	1.176	0.000	1.777
13.5	14	0.107	0.000	0.156
14.5	15	0.030	0.000	0.005
Total (millions)		331.860	60.194	51.395

Table 4.4.4. Sandeel catch structure by age over 2014-2016.

	LFDA- ages			VIT - ages		
	2014	2015	2016	2014	2015	2016
0	182.066	49.903	21.647	182.066	49.903	21.647
1	146.624	10.289	26.563	146.624	10.280	26.563
2	3.085	0.002	3.099	3.034		3.023
3	0.055		0.081			
Total (millions)	331.830	60.194	51.389	331.724	60.183	51.234

Length cohort analysis (VIT)

The growth and length- weight relationship parameters used as input for the LCA are those specified above. Scenarios with different M and Ft were considered. The last size groups were merged as group+. Results are presented in Table 4.4.5. The year 2015 was not considered since the fishery was closed in 2015.

As expected, results are dependent on the M value used, constant and vector, which is shown in the different values of recruitment (R) and biomass (total and SSB). Nevertheless, some interesting outputs can be mentioned. Firstly, the catch mean age is smaller than 1 year and, in 2016, it was higher than in 2014, which was the consequence of delaying the start of the fishing season to April. Under the same scenario (Ft=2, M=1.6) fishing mortality was lower in 2016 than in 2014 i.e. exploitation rate was higher in 2014.The turnover appears to be of between around 200 and 300, all scenarios considered. This means that every year the biomass is renewed (by growth, recruitment and mortalities) 2-3 times.

Results should be taken with caution since the assumption of equilibrium is not met in the sandeel fishery. In the last three years fishing effort has been kept at similar level as in 2012, year of high catches, or lower. Nevertheless, yield has undergone marked variations in this period, with very low abundance in 2015.

Table 4.4.5. LCA results in different assessment scenarios.

2014	M= 1.6 Ft=2	M= 0.661 Ft=3	M vector Ft= 2	M vector Ft= 3
Landings (t)	558.72	558.72	558.72	558.72
Catch mean age (yr)	0.76	0.76	0.76	0.76
R age 0 (millions)	1873.499	143.786	1148.329	1151.138
Bmean(t)	485.373	69.373	327.555	321.403
SSB (t)	99.087	15.537	71.135	65.882
Turnover	275	253	268	273
Fmean	1.5	2.3	1.9	2.3
Y/R(g)	0.30	0.90	0.49	0.49
F(0.1)-factor	0.74	0.20	0.19	0.15
F/F(0.1)	1.4	5.0	5.3	6.7
2016	**M= 1.6 Ft=1**	**M= 1.6 Ft=2**	**M= 0.66 Ft=1.5**	**M vector Ft= 1.5**
Landings (t)	129.763	129.763	129.763	129.763
Catch mean age (yr)	0.98	0.98	0.98	0.98
R age 0 (millions)	518.788	457.004	116.616	89.308
Bmean(t)	231.348	183.534	108.766	98.242
SSB (t)	75.034	52.326	41.238	69.260
Turnover	216	231	185	180
Fmean	0.63	1.0	1.14	1.20
Y/R(g)	0.25	0.28	1.10	1.45
F(0.1)-factor	1.82	0.3	0.39	0.23
F/F(0.1)	0.5	3.3	2.6	4.3

4.5. Sandeel catch and sea-surface temperature in December

The link between sandeel abundance and some environmental variables has been explored. Figure 4.5.1 and Table 4.5.1 shows the relationship between the December temperature (http://marbcn.blogspot.com.es/), i.e. taken as representative of the surface temperature during the reproduction period, and catches the following fishing season. A good correlation between these two variables was observed, but it is not conclusive as an only cause for the observed marked decline of the population in the most recent fishing seasons.

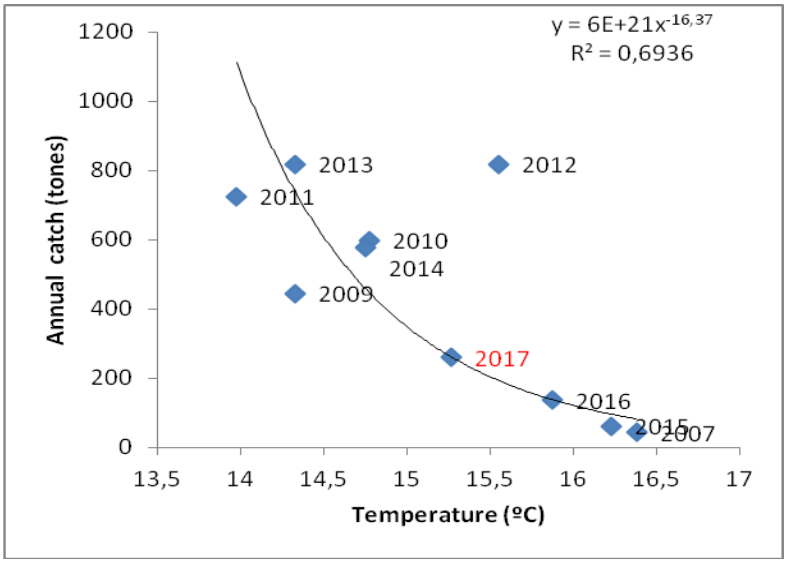


Figure 4.5.1. Relationship between the December temperature and catches the following fishing season. Catch for 2017 (in red) has been predicted by the regression model.

Table 4.5.1. Relationship between the December temperature and catches the following fishing season. Predicted catch for 2017 in red.

Year	Catches (tn)	Tem Dec (t-1)
2007	43,41	16,38
2008	199,18	
2009	443,88	14,33
2010	596,71	14,78
2011	725,07	13,98
2012	818,90	15,55
2013	818,61	14,33
2014	578,52	14,75
2015	61,37	16,23
2016	136,25	15,88
2017	260	15,27

4.6. By-catch composition

The results of the assessment of the by-catch followed the same pattern as the previous years 2012-2013.

The analysis of the boat seine catch for sand eel target species and by-catch species evidenced the high selective catch of the “sonsera” as it was reported in the previous scientific report (Sánchez *et al*. 2013). The presence of by-catch species can

be detected by the echo-sounder, which allows selective fishing operations resulting in catches without or with very few non- target species.

The percentage in weight of by-catch species regarding the total sand eel catch was very low over the study period (2014-2016) following the same trend as in the previous years. The percentage varies between 2 and 8 % depending of the total kg of the sand eel.

Analysis

The by-catch species composition from the fishing grounds where the boat seine fleet operates was analysed following the pattern developed in the previous report. Scientific cruises during the fishing seasons from 2014 to 2016 were carried out and samples were obtained on board 2 times a month from five ports in the Catalan coast (Arenys de Mar, Blanes, Sant Feliu de Guíxols, Palamós and L'Estartit). Even during the closed season, from 15 December to 28 February, samples of non-target species were collected. Later, in the laboratory, species were identified and length and weight were obtained for each specimen.

In a parallel way, fishermen filled in specific forms with the daily information of catch including sand eel and by-catch species, depth, geographic position and time at sea of each haul.

In order to assess the "sonsera" selective activity two different information sources were analyzed: on board observers, and fishermen forms.

Results

The by-catch species analysed at the ICM during the period 2014-2016 evidenced a low biomass with respect the total catch of sonso.

The Table 4.6.1 evidences the low biomass of by-catch species by comparing the total catch of sand eel and the total catch of by-catch species.

The year 2014 with the maximum catches of sand eel showed the minimum biomass of the by-catch species (Figure 4.6.1; Table 4.6.1). From the general information of this table, it should be taken into account that a high % of by-catch species is recorded when the catch of the sonso is low and viceversa, a high capture of sonso shows a low % of by-catch.

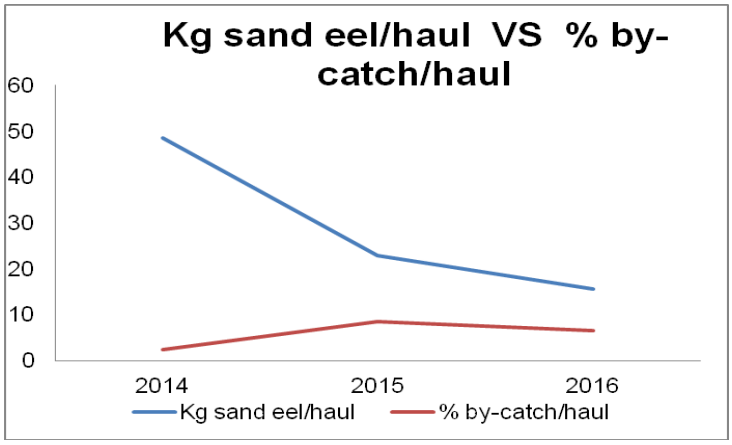


Figure 4.6.1. Yearly relationship between Kg of sand eel and percentage of by-catch per haul.

Table 4.6.1. Summary of number of hauls and species during the period 2014-2016. Total sand eel per haul and percentage of by-catch biomass per sand eel haul.

Years	Nº hauls	Nº species	Kg sand eel /haul	% by-catch biomass /haul of sand eel
2014	31	27	48,48	2,37
2015	10	14	22,97	8,47
2016	11	20	15,61	6,55

More detailed information regarding the biomass of the by-catch species is presented on the Figure 4.6.2. The analysis of the average of percentages of the biomass of the by-catch species of the 3 years analysed showed that the higher biomass percentage was for the commercial species *Scomber colias* (45%) and *Pagellus erythrinus* (13%) and the third species was the non-comercial species *Synodus saurus*.

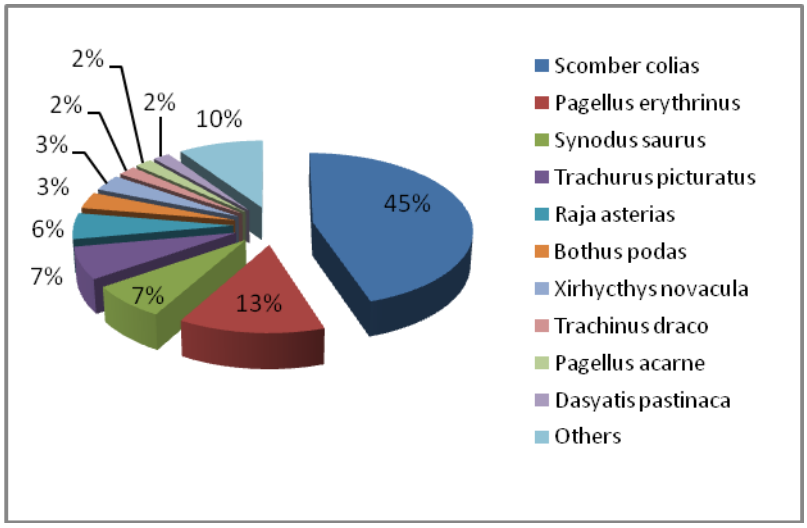


Figure 4.6.2. Average percentage of biomass of by-catch species per haul of sand eel considering the three analysed years 2014-2016.

Even with not an important biomass in catches, it is important to note that of the assemblage of the by-catch species a lot of them are regulated commercial species with a minimum legal size (MLS). The Table 4.6.2 is a summary of the abundance and biomass of the commercial species that are by-catch of this fishery.

It is important to take into account the information of daily by-catch species registered from the information of the fishermen forms has not been taken into account due to the irregular reported information. The information registered the by-catch species but not in a way good enough to analyse neither abundance nor biomass. Nevertheless, it is important to highlight that, in general, the by-catch species reported are the same controlled in the laboratory after the cruises on board.

Table 4.6.2. Abundance in number (A) and Biomass in gr (B) of captured regulated by-catch species by haul of sand eel. Average of Abundance and Biomass from 2014 to 2016.

Species	A/haul 2014	B/haul 2014	A/haul 2015	B/haul 2015	A/haul 2016	B/haul 2016	Mean A/haul 2014-2016	Mean B /haul 2014-2016
Belone belone	1,19	1,13	0,1	6	0,09	5,45	0,46	4,19
Engraulis encrasicolus	1,71	0,09	7,4	0,91	0,73	1,34	3,28	0,78
Mullus barbatus	0	0	0,1	0,09	0	0	0,03	0,03
Mullus surmuletus	0	0	0,67	2,67	0	0	0,22	0,89
Octopus vulgaris	0,03	29,03	0	0	0	0	0,01	9,68
Pagellus acarne	0	0	16,7	29,5	0,18	20	5,63	16,5
Pagellus erythrinus	5,49	207,56	8,2	81,38	0,55	46,82	1,27	111,92
Sardina pilachardus	0,03	0,22	0	0	0,18	0,8	4,75	0,34
Scomber colias	1,98	1139,66	0	0	0	0	0,07	379,89
Scomber scombrus	0,06	16,9	0	0	0	0	0,66	5,63
Trachurus mediterraneus	0,06	0,16	0	0	0,09	6,82	0,02	2,33
Trachurus picturatus	1,51	171,4	0	0	0	0	0,05	57,13
Trachurus trachurus	0	0	0	0	1,55	1,76	0,50	0,59
***Trachurus* sp.**	0	0	8	40	0,36	0,46	0,52	13,49

Seasonal analysis of the regulated species is presented on Figure 4.6.3 and shows the sizes of these species related to the monthly catches and with their MLS on the 3 studied years.In this figure it can be seen that individuals below the MLS were not captured for *Belone belone* or *Scomber sp.* However, for *Pagellus erythrinus, Trachurus sp.* and *Sardina pilchardus* individuals were captured both below the MLS and above. In the case of *Pagellus erythrinus* juveniles were caught between the months of September and November. Juveniles of *Trachurus sp.* were caught in the months of February and October and *Sardina pilchardus* only one small individual was captured in the month of September.

Finally, there were three species that were always captured below the MLS, these were: *Pagellus acarne, Mullus sp.* and *Engraulis encrasicolus*. In particularly a matter of concern regards the important abundance of juveniles of *Pagellus acarne* captured in the months of February and March.

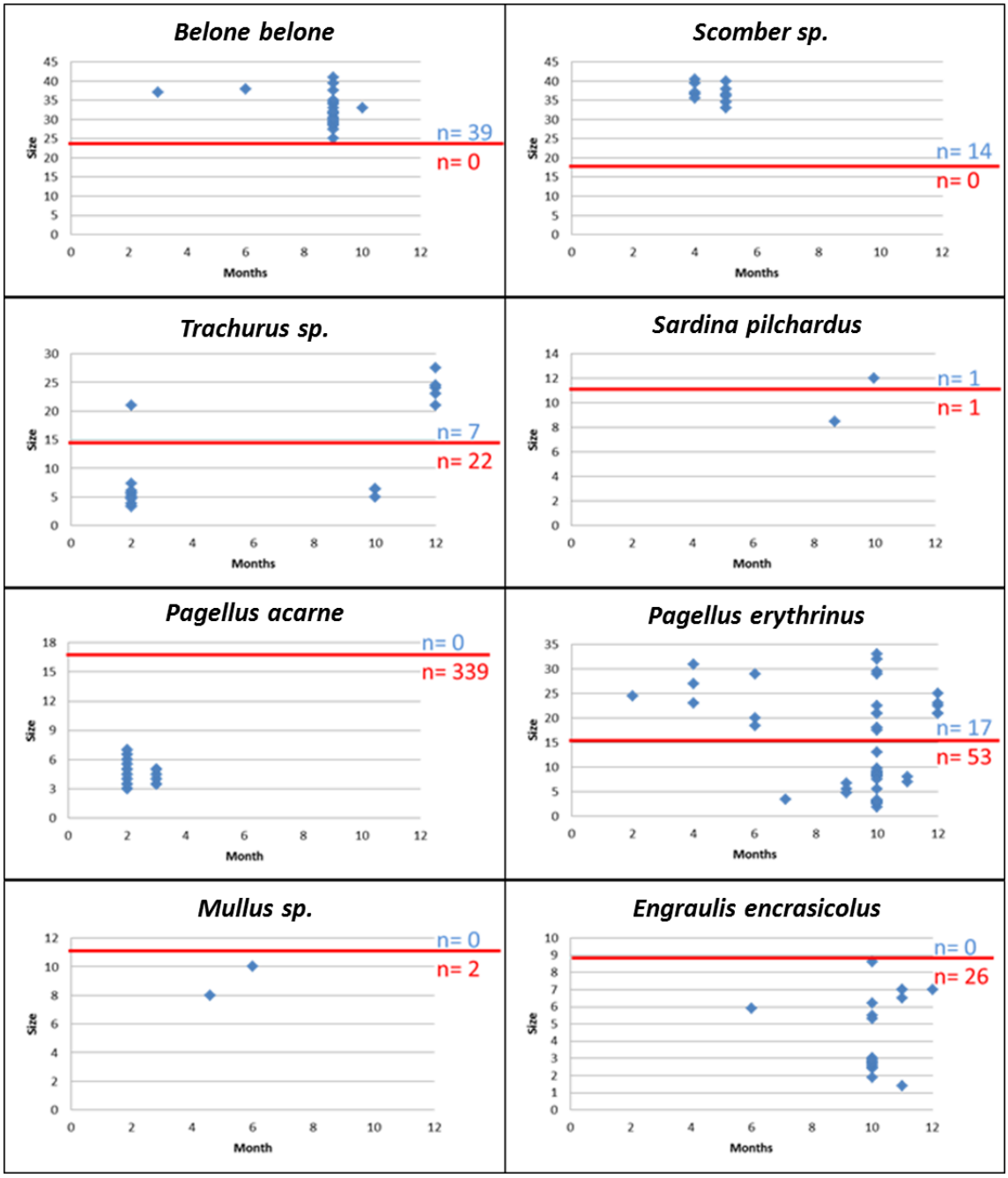


Figure 4.6.3. Size of regulated by-catch species by months, MLS (red line), number of animals above MLS (blue letter) and number of animals below MLS (red letter).

5. BIOLOGY OF GOBIDS

5.1. Taxonomy

Aphia minuta (Risso, 1810)

*Diagnosi*s: Dorsal spines (total): 4-6; Dorsal soft rays (total): 113; Anal spines: 1; Anal soft rays: 11-15. Vertebrae 26-28 (Whitehead *et al*. 1986). *Aphia minuta* is a small species no more than 6 cm long (Tortonese 1975) with a short lifecycle and rapid maturation of the gonads. The specimens present a long body flattened laterally. The scales are cycloid and easily lost. There are no scales on the nape of the neck or the first dorsal fin. The swim bladder is evident and persistent and the food canal is straight and short. The adults are white, yellowish or pink; the body is transparent with a few black chromatophores. In proximity to the opercules a red spot can be observed due to the blood of the gills, visible because of the animal's transparency. This species presents sexual dimorphism: the males have a larger head, uneven teeth, a higher caudal peduncle and the fins are more developed, especially the ventral ones.

Distribution: *Aphia minuta* is spread throughout the Atlantic Ocean from Gibraltar to the Norwegian coasts, the North Sea and the western Baltic Sea. It is also present all over the Mediterranean basin including the Black Sea (Miller 1986).

Biology: It is a coastal species, pelagic in the larval and young stage. During sexual maturity the organisms acquire demersal-benthic habits.

Crystallogobius linearis (Düben, 1845)

Diagnosis: Dorsal spines (total): 2-3; Dorsal soft rays (total): 18-20; Anal spines: 1; Anal soft rays: 20-21. Patterns of sensory papillae require detailed description. Pronounced sexual dimorphism. Anterior nostril a short tube. Pectoral fin uppermost rays within membrane. Males: with prominent front canine teeth; pelvic disc complete and deep; 1st dorsal with only 2 with rays. Females: pelvic disc reduced or lacking; 1st dorsal absent or rudimentary. Vertebrae 30 (29-31) (Miller 1986).

Distribution: Eastern Atlantic: Lofotens, Norway, to Gibraltar. Also known from the Mediterranean Sea. Eastern Central Atlantic: Madeira Island (Wirtz *et al*. 2008).

Biology: This occasionally territorial species occurs in coastal waters, over shell, sand, or mud bottoms; males bottom-living during breeding season. Feed on zooplankton (Wheeler 1992). Spawning takes place when 1 year old. Adults die afterwards. Eggs are laid in the empty tube-worms and are guarded by the male (Muus and Nielsen 1999). Eggs are pear-shaped (Miller 1986).

Pseudaphya ferreri (O De Buen & Fage, 1908)

Diagnosis: Teeth size does not differ markedly between sexes. Dl V, D2 I + 7-10, A I + 9-10, P 15-16. Scales in lateral series 25-30. Vertebrae 30. Colour: body transparent, with rosy stippling on sides, head and bases of median fins; caudal fin base with large triangular dark spot. Size: to 3.5 cm (Miller 1986).

Distribution: It is found in the Mediterranean Sea in the western basin and the Adriatic Sea. Habitat: nektonic, over sandy beaches.

Biology: The females mature to 26-27 mm. Reproduction in June.

5.2. Length-weight relationship and length frequency

Aphia minuta

Length-weight relationship

Figure 5.2.1 gives the length-weight relationship for *Aphia minuta* whole population. Positive allometric growth was observed in the species.

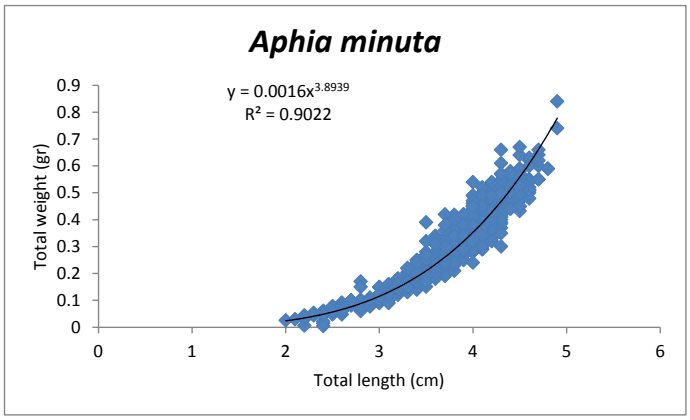


Figure 5.2.1. *A. minuta* length-weight relationship (a and b parameters) obtained for the present study period (2014 - April 2017).

Length frequency

The monthly length-frequency distribution in the catches of *A. minuta* ranged between 1.5 and 4.5 cm, with no clear mean size trend throughout the fishing season from January to April. (Figure 5.2.2). No clear growth pattern can be observed on length frequency distribution. Compared with the previous studied period (2012-2013) catches range size of *A. minuta* has shifted to smaller lengths and the fishing period has been shortened to 3-4 months. There is a remarkable interannual variability.

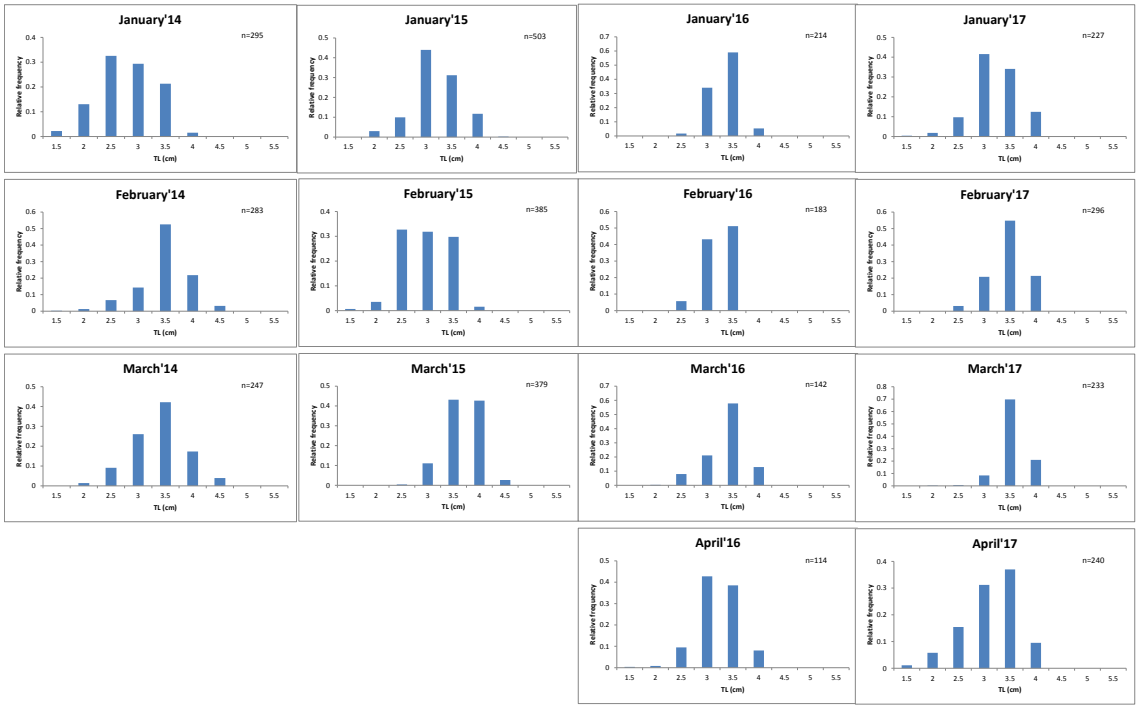


Figure 5.2.2. Monthly length-frequency distribution (January 2014 to April 2017) of *A. minuta* (n number of individuals sampled) and summary of the mean length by month. Mean length data of the previous study (2012-2013) is included.

Table 5.2.1. *A. minuta* summary of the mean length by month. Mean length data of the previous study (2012-2013) is included.

	Mean length				
	2012-13	2014	2015	2016	2017
December	2.8				
January		2.76	3.20	3.34	3.22
February	3.42	3.48	2.95	3.23	3.47
March	3.5	3.38	3.68	3.37	3.55
April	3.54			3.21	3.11
May	3.82				

Crystallogobius linearis

Length-weight relationship

Figure 5.2.3 gives the length-weight relationship for *C. linearis* whole population. Positive allometric growth was observed in the species.

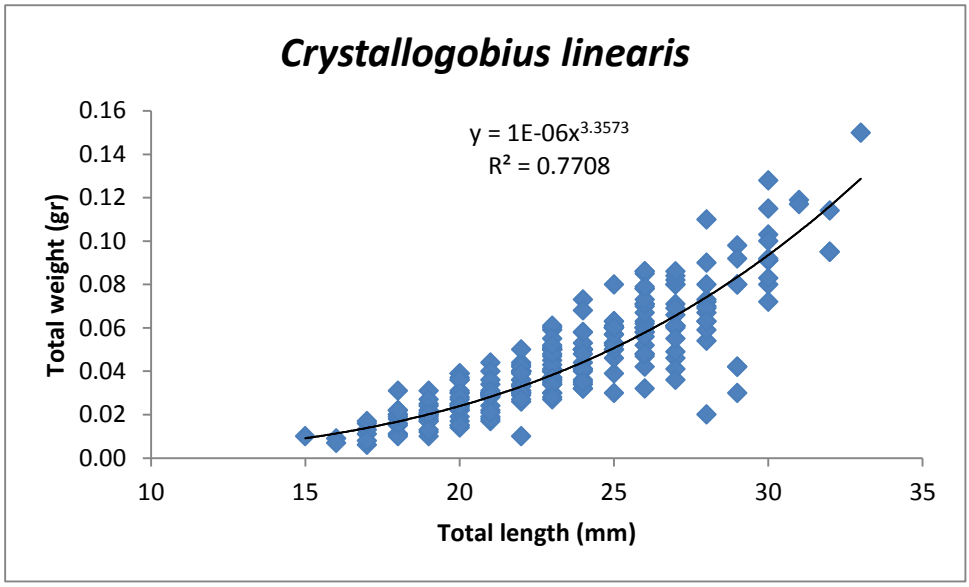
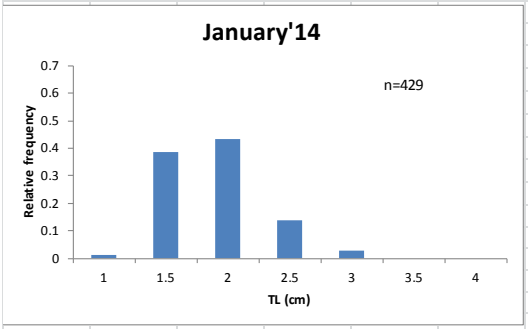


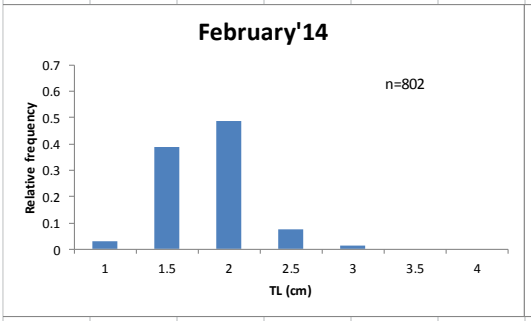
Figure 5.2.3. *C. linearis* length-weight relationship (a and b parameters) obtained for the whole study period (2014-2017).

Length frequency

The monthly length-frequency distribution in the catches of *C. linearis* ranged between 1 and 3 cm. The catch season has been reduced during the period 2014-17 to January and February months. Mean size shows lower values in the present period compared with the previous one (2012-2013) and a not defined growth pattern can be observed on the scarce length frequency distributions obtained (Figure 5.2.4).



	Mean length				
	2012-13	2014	2015	2016	2017
January	2.23	1.89			
February	2.65	1.83			2.04
March	2.16				
April	2.53				
May	2.55				



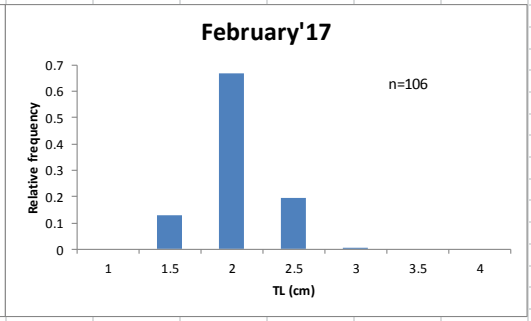


Figure 5.2.4. Monthly length-frequency distribution (January and February 2014, February 2017) of *C. linearis* (n number of individuals sampled) and summary of the mean length by month. Mean length data of the previous study (2012-2013) is included.

5.3. Reproduction

Aphia minuta

In the studied period (2014-2017) some mature females were found in March and April but there is no enough information to stablish well defined reproductive parameters.

Crystallogobius linearis

From a total of 251 individuals examined, some individuals with visible oocytes have been observed in January and February sampled months (12 ind), but the majority of the population is in a resting phase. Due to the scarce information obtained about reproductive phases it is not possible to define reproductive parameters.

6. GOBIDS FISHERY

6.1. Boat seine fleet and landings

Historically, only a small number of boats, four to six, targeted gobid species (i.e. at least around 20 fishing days per fishing season), and the fishing season extended from November to May.

The gobids fishing season was shortened in the present studied period, from mid-December 2014 to the end of May 2015 and from mid-December to the end of April for seasons 2015-2016 and 2016-2017, and the main targeted species was transparent goby (*Aphia minuta*). Landings and activity (fishing days) for transparent goby from 2011-2012 to the current situation, corresponds to two boats and all landings are registered in Barcelona port.

There are registered catches for crystal goby (*Crystallogobius linearis*) only during the period of January to March 2014 and in February/March 2017 corresponding to Arenys de Mar and Blanes ports. There are not catches registered for *Pseudaphia ferreri* species in the current period studied.

Landings

Data on transparent goby (*Aphia minuta*) and crystal goby (*Crystallogobius linearis*) landings and activity of the boat seine fleet were obtained from the daily slips from the sale at the auction that takes place upon the arrival of the vessels at port (data source: fishing statistics elaborated by the Fisheries Department of the Generalitat de Catalunya). Data were available on daily landings, separately for each species, by vessel, for the period 2001 to May 2017.

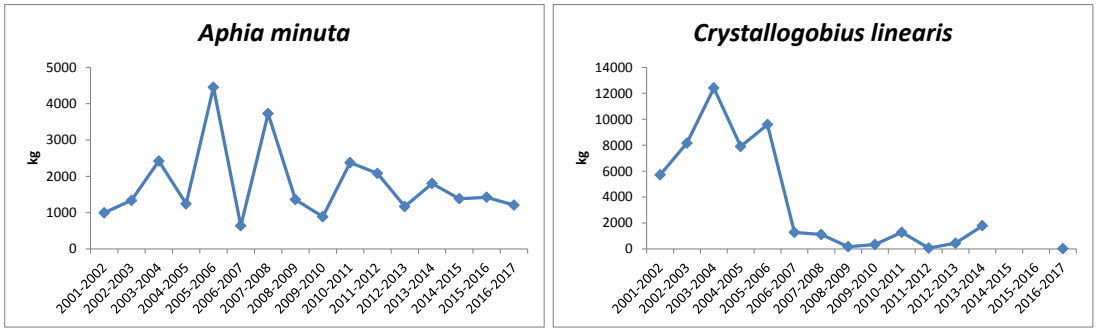


Figure 6.1.1. Transparent goby (left) and crystal goby (right) landings (kg) in the Catalan Coast over the fishing seasons (November to May) 2001-2002 to 2016-2017.

The boat seine fleet operates in the central and northern Catalan Coast (i.e. from Barcelona to the north). Nevertheless, transparent goby is fished in the southern study area, near Barcelona, close to the mouth of River Llobregat; and crystal goby is fished a little northwards, close to the fishing port of Blanes. Over the studied period, the annual landings of both species fluctuated markedly. Transparent goby landings varied between around 0.5 t in 2006-2007 and 4 t in 2005-2006; and those of crystal goby, between 12.4 t in 2003-2004 and landings practically nil since 2006-2007 and no landings registered since mid-2014 to 2016, in 2017 only testimonial landings corresponding to 2 days fishing of one boat (16 kg). Since 2013 a quota for gobiids fisheries has been stablished. These quotas are 1800 kg for transparent goby and 3800 kg for crystal goby. For transparent goby the quota has been regularly reached. In the case of crystal goby the last years (end 2014-2017) fishermen have not practically fished this species and consequently quota has not been reached.

No landings are registered for *Pseudoaphia ferreri* since March 2012 to now. The explanation the fishermen offered for the absence of Ferrer's goby in the catches was that this species is jointly fished with sand eel in certain fishing grounds. Since the target species of the sampling was sand eel, the fishing grounds that were visited were those with presence only of sand eel.

Fishing days, per fishing season

Historically, the fishing season extended from November to May, that is, partly overlapping with the sand eel fishing season (March to mid-December). The unit of effort considered in this study is the number of fishing days (i.e. the sum of the number of days each boat seiner sold gobids at the auction upon arrival to port). Transparent goby fishing days and CPUE kg/day per vessel) trends (Figure 6.1.2) have been stabilized after the quota establishment. In the case of crystal goby, fishing days and CPUE follow the same trend as catches.

The gobids fishery represents a small part of the overall boat seine fleet landings and activity.

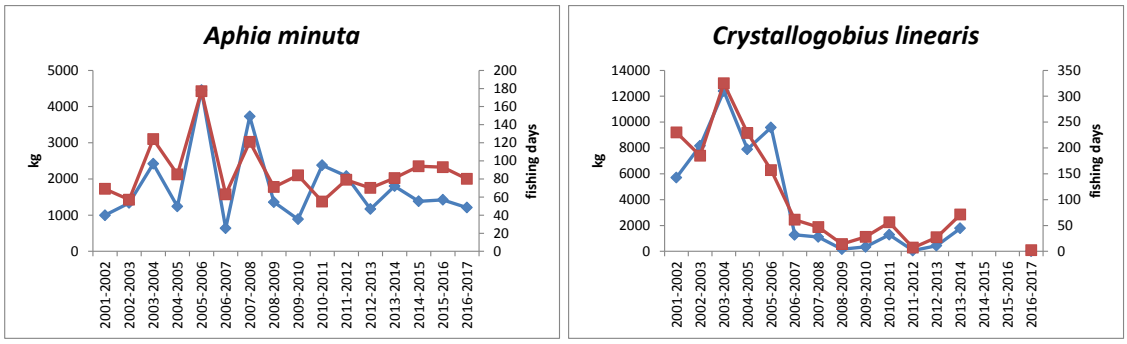


Figure 6.1.2. Landings (kg; in blue, left axis) and fishing days (in red, right axis) trend of transparent goby and crystal goby in the Catalan Coast over the fishing seasons 2001-2002 to 2016-2017.

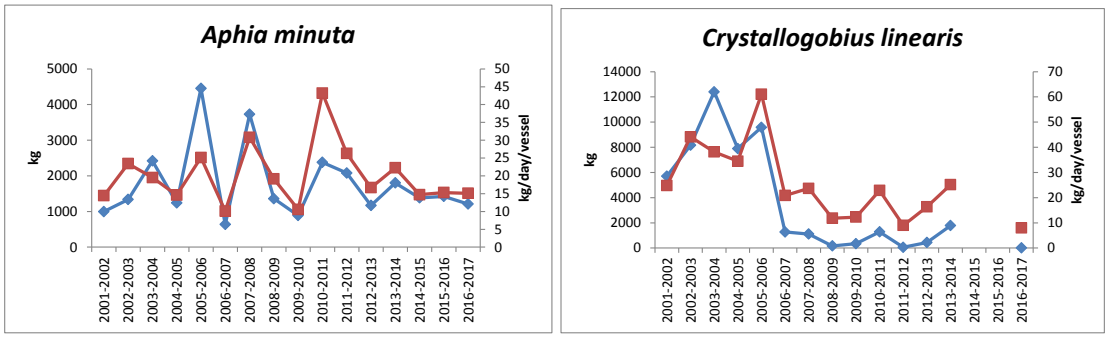


Figure 6.1.3. Landings (kg; in blue, left axis) and fishing season CPUE (kg/day per vessel; in red, right axis) trend of transparent goby and crystal goby in the Catalan Coast over the fishing seasons 2001-2002 to 2016-2017.

6.2. Assessment

During the studied period (2013-2014 to 2016-2017) in the study area the boat seine fleet targets one gobid species: transparent goby (*Aphia minuta*) and secondarily crystal goby (*Crystallogobius linearis*) (2013-2014 and 2016-2017).

Historical Series

The data source on landings and fishing effort is the same used in section 6.1. Data are presented at annual and monthly scales. The unit of effort considered is the number of fishing days (i.e. the sum of the number of days each boat seiner sold transparent goby and crystal goby at the auction upon arrival to port). Monthly catch

per unit of effort (CPUE) was calculated as kg per day and vessel. Data are presented by fishing season i.e. from December to April.

Catch and CPUE

Over the fishing seasons 2001-2002 to 2012-2013, landings of the two species displayed marked fluctuations, as shown in section 6.1 (Figure 6.1.1). In the case of the transparent goby, the landings fluctuations were inter-seasonal, and ranged between 0.5 t in 2006-2007 and 4 t in 2005- 2006. In crystal goby landings, though, two period are distinguished, from 2001-2002 to 2005-2006 fishing seasons, with landings > 5 t per season and a peak in 2003-2004 (12.4 t), and from 2006- 2007 onwards, with landings negligible. No explanation is available on whether the very low landings of crystal goby in this period are due to under-reporting or to a change in the fishermen's strategy.

The monthly landings, fishing days and CPUE (kg/day per vessel) trends over 2001-2002 to 2012-2013 are presented in Figures 6.2.1, 6.2.2 and in Figures 6.2.3, 6.2.4 for the period 2013-2014 to 2015-2017 for transparent goby and crystal goby respectively. These figures show and suggest some questions regarding the boat seining gobids fishery, based on annual species with very short life cycle.

i. In transparent goby species, highest landings did not occur at the beginning of the fishing season, which suggests that the onset of the fishing season was not coincidental with the massive incorporation of recruits. In recent years, March was the month with more landings peaks, but these were also observed in April. Regarding crystal goby, the high variability in the timing of occurrence of highest landings and the scarcity of catches in recent years, don’t allow drawing any conclusion about this fishery.

ii. Generally, landings, fishing days and CPUE trends are variable, with a decreasing trend at the end of the season in some years.

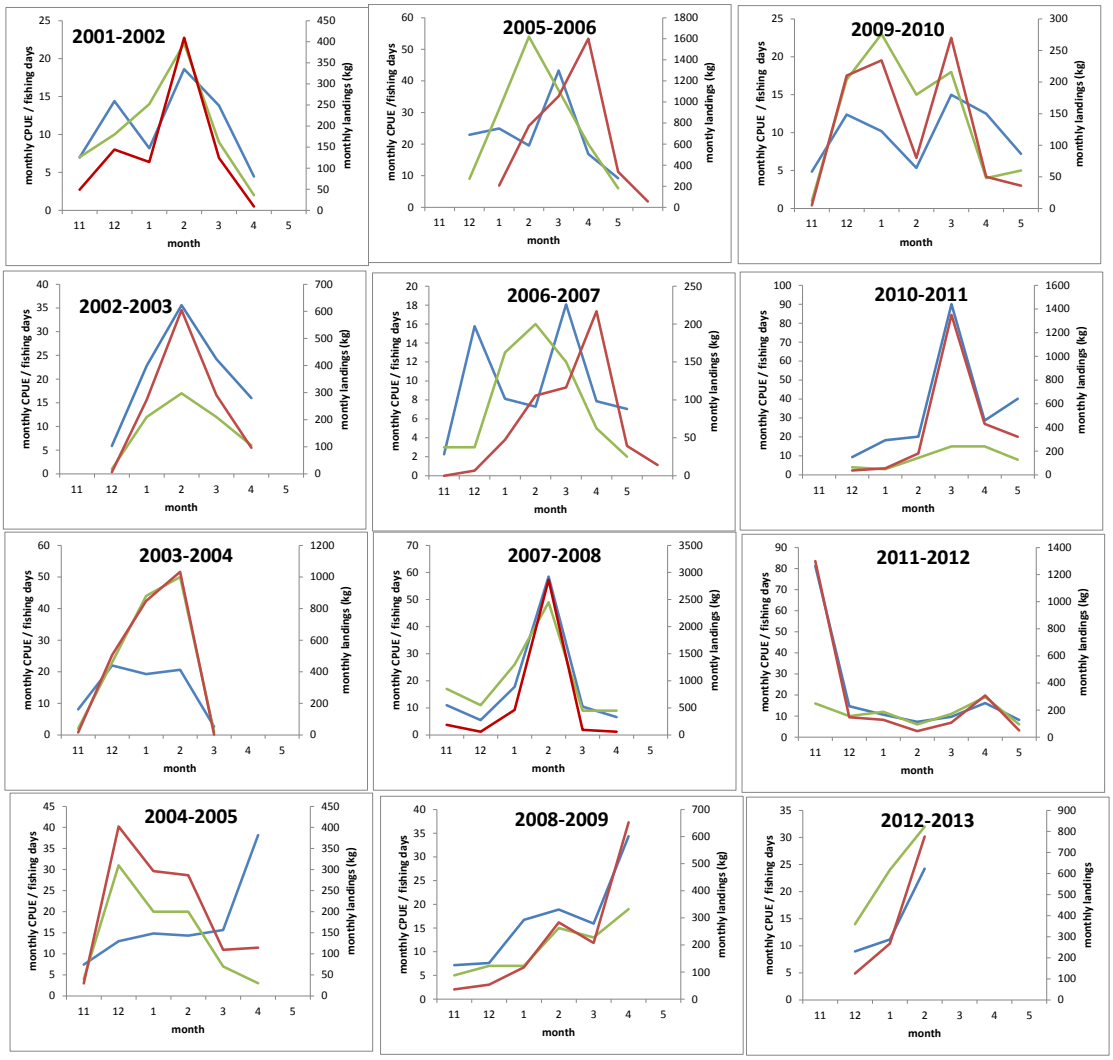


Figure 6.2.1. Transparent goby (*Aphia minuta*). Monthly CPUE (kg/day per vessel; blue; left axis), fishing days (green; left axis), and landings (in kg; red; right axis). Previous study.

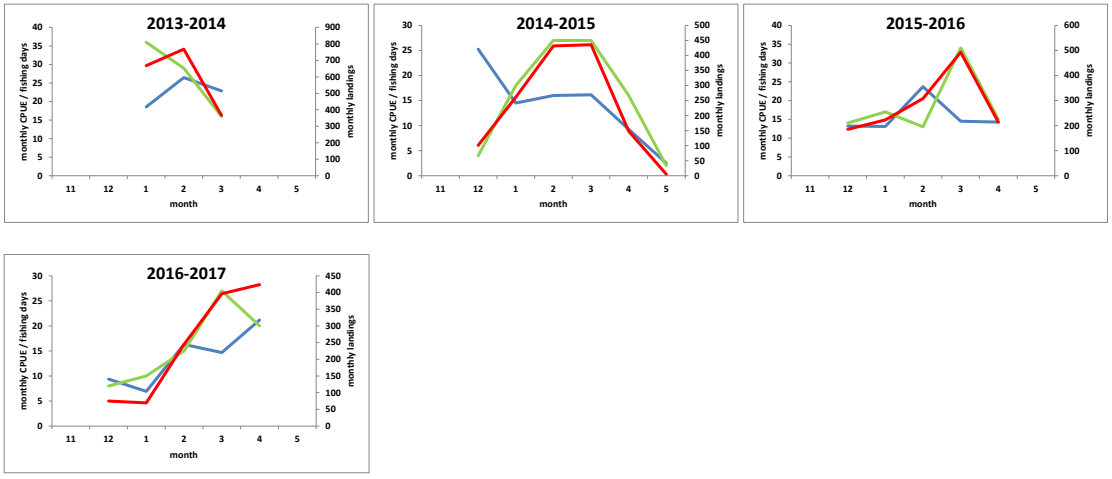


Figure 6.2.2 Transparent goby (*Aphia minuta*). Monthly CPUE (kg/day per vessel; blue; left axis), fishing days (green; left axis), and landings (in kg; red; right axis). Present study.

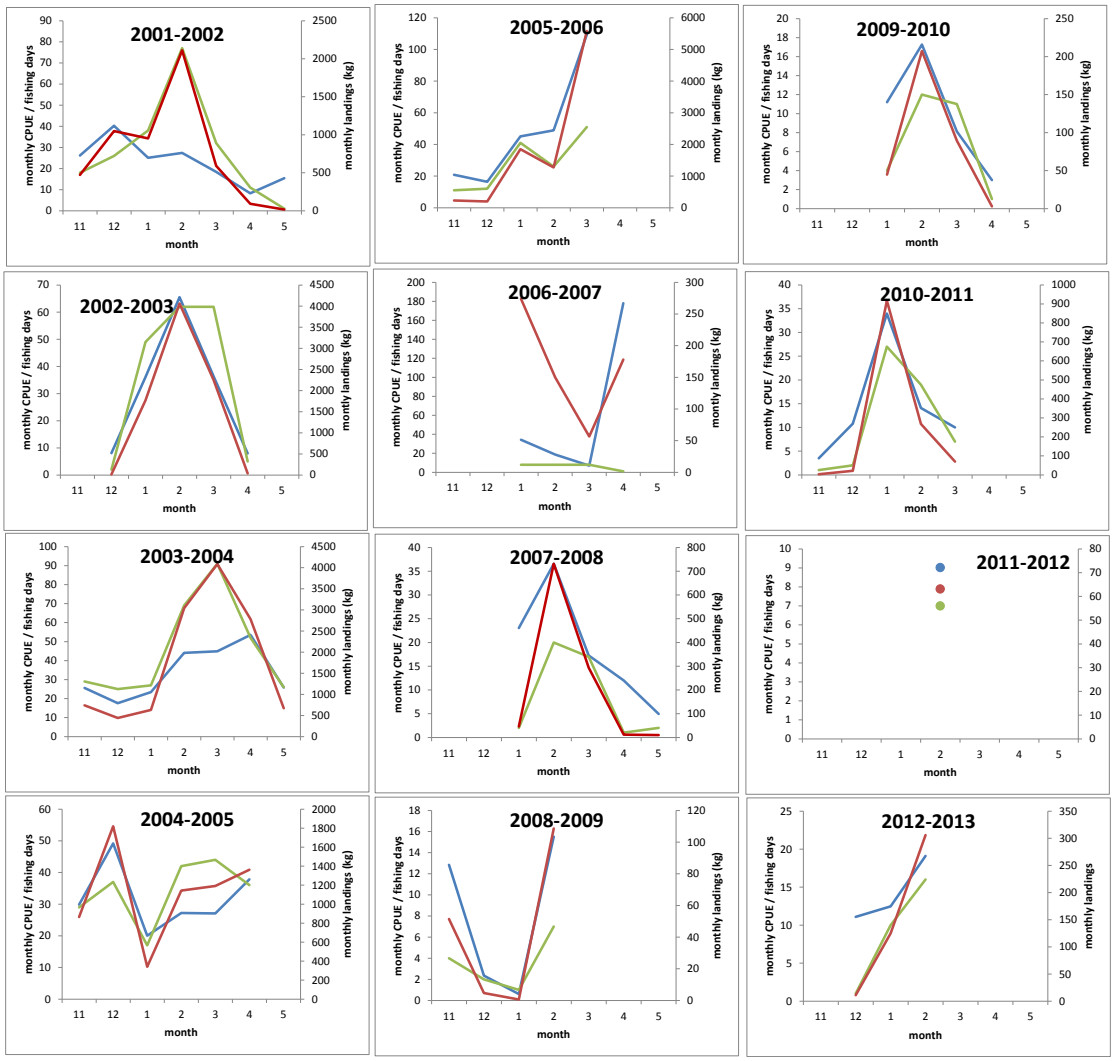


Figure 6.2.3. Crystal goby (*Crystallogobius linearis*). Monthly CPUE (kg/day per vessel; blue; left axis), fishing days (green; left axis), and landings (in kg; red; right axis). Previous study.

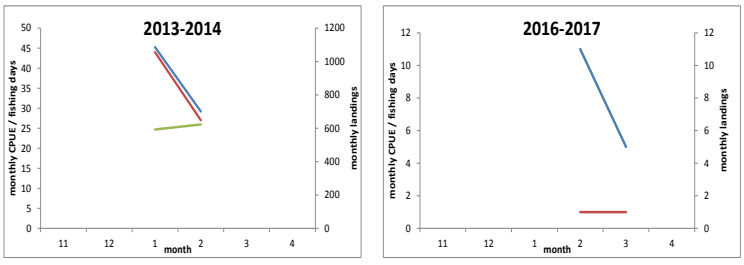


Figure 6.2.4. Crystal goby (*Crystallogobius linearis*). Monthly CPUE (kg/day per vessel; blue; left axis), fishing days (green; left axis), and landings (in kg; red; right axis). Present study.

The *Aphia minuta* life cycle is short, usually lasting only one year and ends shortly after reproduction. The breeding season is quite long and spawning takes place at least twice during its short life span. The existence of two different annual cohorts has been proposed (La Mesa *et al*. 2005, and references therein). This hypothesis might explain the CPUEs and landings trend in some fishing seasons, as shown in Figures 6.2.5 and 6.2.6.

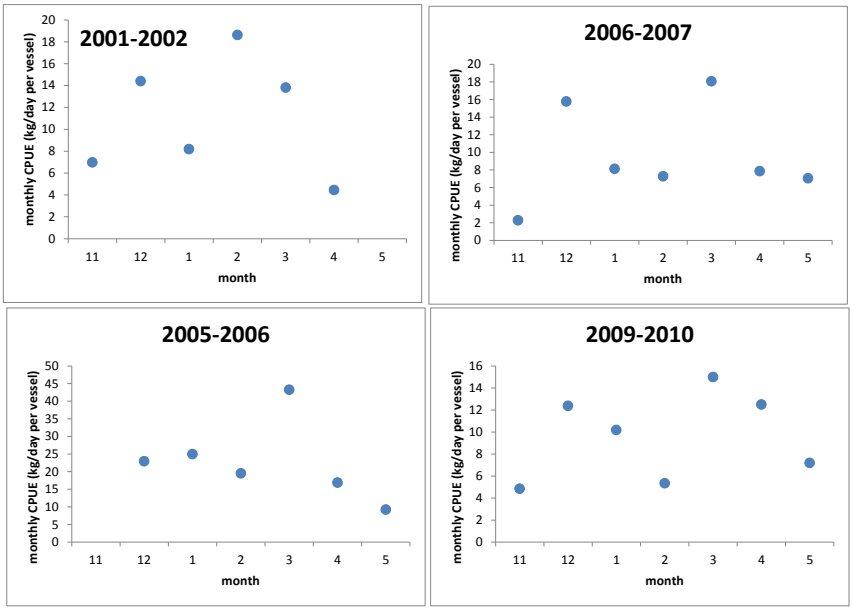


Figure 6.2.5. Transparent goby (*Aphia minuta*). Monthly CPUE (kg/day per vessel) trend in fishing seasons displaying more than one peak.

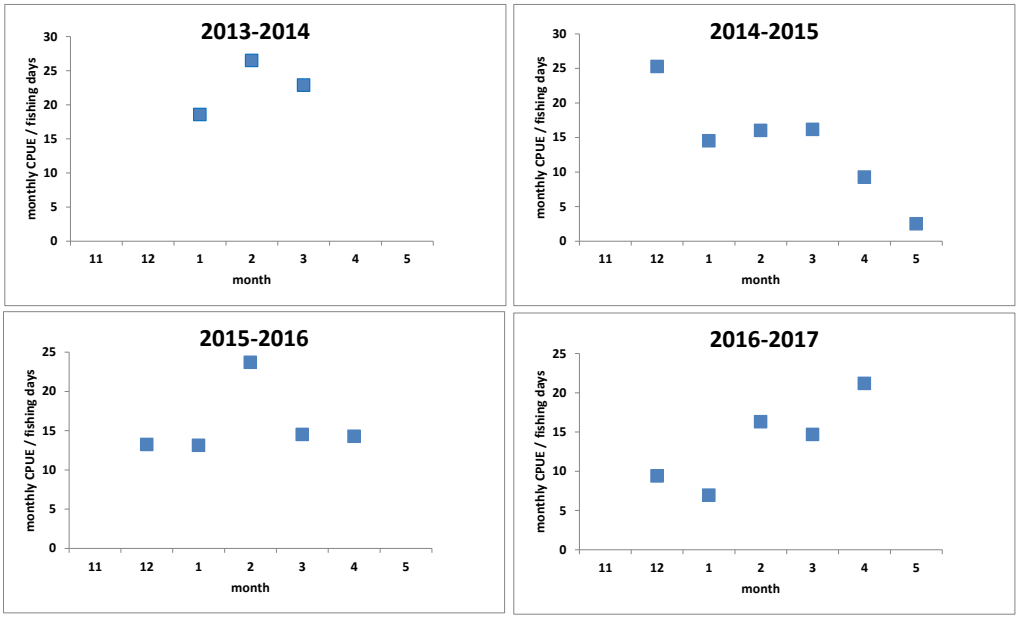


Figure 6.2.6. Transparent goby (*Aphia minuta*). Monthly CPUE (kg/day per vessel) trend in recent fishing seasons displaying one peak.

Biomass estimation. Depletion methods

Depletion methods are based on the principle that a decrease in the CPUE as the population is reduced or depleted is directly related to the extent of population decrease. This is not the case in the boat seine gobids fishery and this is why this methodology has not been applied. As shown in Figures 6.2.1 to 6.2.3, the highest CPUE are not obtained at the beginning of the fishing season, which suggest that the onset of the fishing season is not coincidental with the massive incorporation of recruits; the CPUE trend may display more than one peak along the fishing season; and, also, CPUE trend in the last months of the fishing season is increasing in some years, suggesting increasing abundance by the end of the season.

6.3. By-catch composition

The by-catch composition from the fishing grounds where the “sonsera” boat seine fleet operates was studied by scientific cruises from January 2014 to April 2017. Samples were monthly obtained on board from Barcelona port. The objective species is the transparent goby, *Aphia minuta*. Later, in the laboratory, species of by-catch were identified and length and weight were obtained for each specimen.

The weight ratio between transparent goby and the by-catch species presented a different picture from that presented in the case of the sand eel.

In this case the study of the selectivity had only information from the sampling on board and all by-catch species retained in the gear were analyzed, that is, including the species that otherwise would have been returned at sea alive. Information from fishermen log-books did not exist. The analysis of percentage in weight of target species versus non-target species pointed out the selectivity of this kind of fishery.

It is important to notice that the by-catch species analyzed would have been released at sea alive if it had not been studied. Commercialization of by-catch species was forbidden during the scientific study as in the case of sand eel.

Transparent goby, *Aphia minuta*

The by-catch species percentage in weight in *Aphia minuta* catches showed a 6.7%, which represents 260 kg of transparent goby against 19 kg of by-catch species. More than 20 species can be caught regularly throughout the study and, although the number of individuals is low, the percentage is high due to relationship of weights.

For instance: 0.9% of annular seabream *Diplodus annularis*, 0.7% of *Pagellus acarne* and 0.6% of common Pandora *Pagellus erythrinus* which represents 50, 25 and 25 individuals respectively. Juveniles of small pelagic such as European anchovy *Engraulis encrasicolus* were present of 0.04% in January and February.

Minimum size

The commercial species more abundant and frequent were analyzed and their length frequency distribution presented. Figure 6.3.1 shows the distributions of by-catch species observed in the previous study. Figure 6.3.2 shows the frequency distributions of by-catch species in the period 2014-2017.

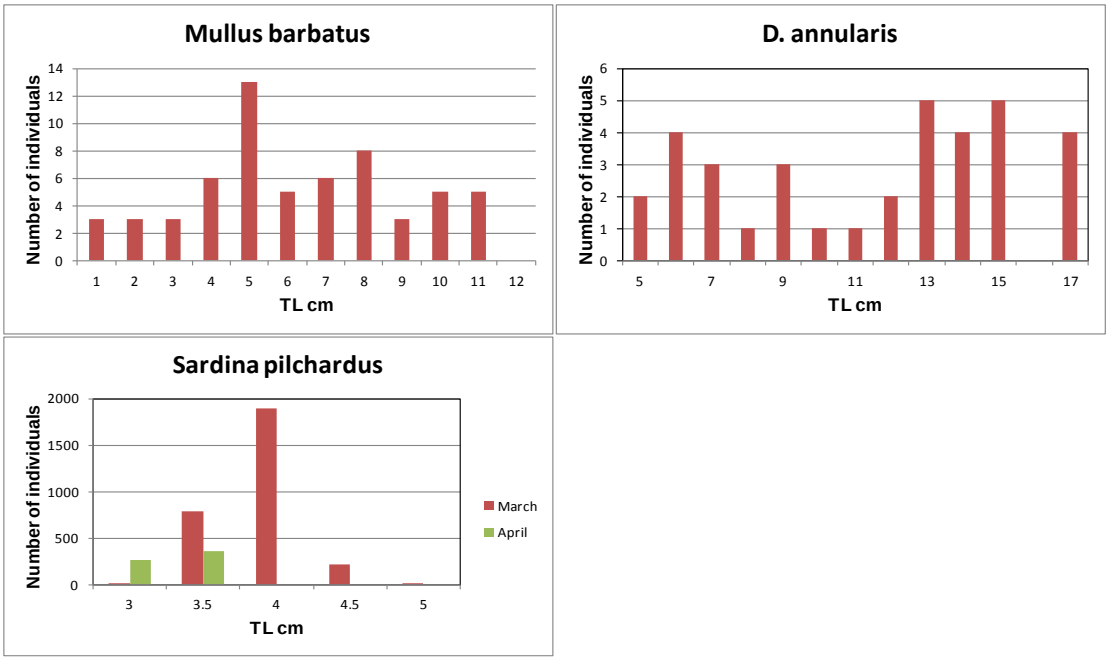


Figure 6.3.1. Length frequency distribution of *Mullus barbatus, Diplodus annularis* and *Sardina pilchardus* retained as by-catch of transparent goby (previous study).

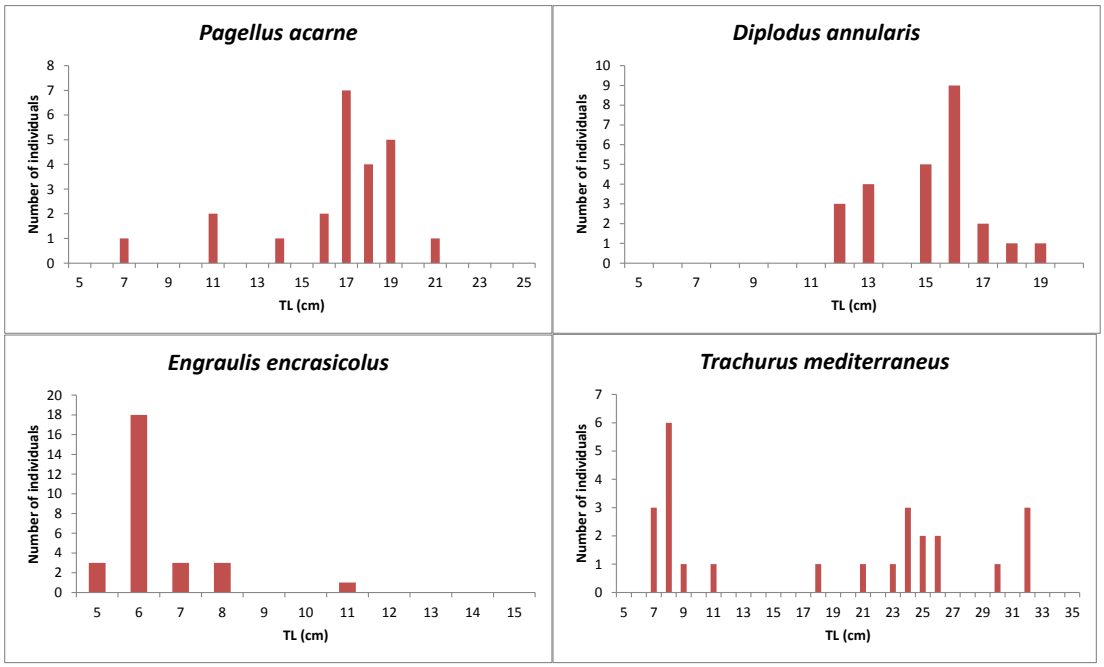


Figure 6.3.2. Length frequency distribution of *Pagellus acarne, Diplodus annularis, Engraulis encrasicolus* and *Trachurus mediterraneus* retained as by-catch of transparent goby (period 2014-2017).

Sparids, *Pagellus acarne* and *Diplodus annularis* appeared as bycatch from January to April, 25 and 50 individuals respectively. *P. acarne* the smallest individuals (<11 cm) have been caught in January and the biggest ones in March and April. In the present study, *D. annularis* recruits (<10 cm) have not been captured as bycatch.

Catches of the small pelagic *Engraulis encrasicolus* consisted of a total of 90 individuals, mainly recruits (<9 cm). Horse mackerel (*Trachurus mediterraneus*) individuals caught corresponded to a total of 50 with a wide length range (7-32 cm) and they were caught in January and February.

In contrast with the previous period analyzed, in the present study catches of *Mullus barbatus* and *Sardina pilchardus* have been negligible, corresponding to 22 and 2 individuals respectively in the whole period (2014-2017).

Crystal goby, *Crystallogobius linearis*

Crystallogobius linearis fishery behaves similarly to *Aphia minuta*, with a high number of by-catch species which, being much heavier than the targeted gobid species, result in high weight percentages of the total catch.

Throughout the present study period 117.7 kg of crystal goby against 77.8 kg of by-catch species were analyzed. Based on this relationship the percentage of the most frequent species among all the by-catch is presented. The percentage in weight of *Spicara* spp., *Boops boops*, *Pagellus erythrinus* and *Mullus barbatus* was 36.4%, 5.3%, 4.3% and 3.2% respectively that corresponded to 1736, 62, 54 and 123 individuals respectively. Regarding cephalopods, *octopusses* and squids, were represented with percentages of 9.4% and 1% respectively that correspond to 15 and 10 individuals respectively.

Minimum size

In order to compare with previous study (Figure 6.3.3), the length frequencies obtained in the present period (2014-2017) of *Pagellus erythrinus* and *Mullus barbatus* are shown (Figure 6.3.4). Results on *Spicara* spp. length frequencies are also shown. In the present period (2014-2017) length sizes are a bit higher than in the previous one for both *P. erythrinus* and *M. barbatus*; smallest individuals are not present in catch.

As mentioned in the case of sand eel and transparent goby, these by-catch species, retained for analysis, would have been returned at sea alive.

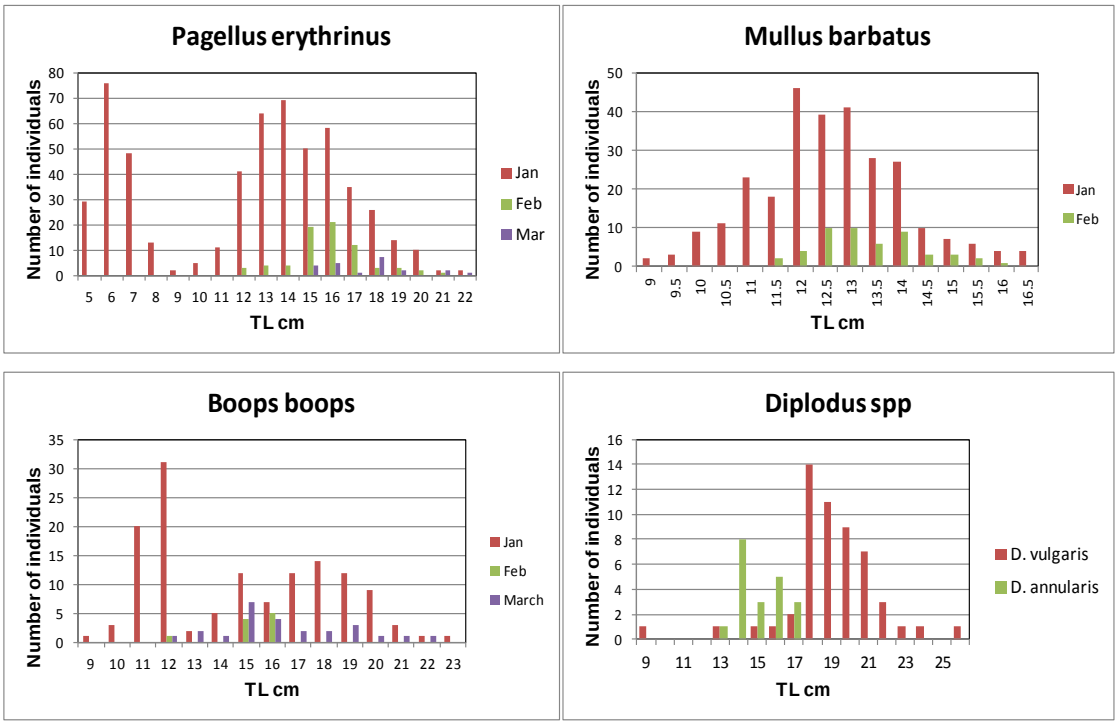


Figure 6.3.3. Length frequency distribution of *Pagellus erytrhinus, Mullus barbatus, Boops boops* and two species of *Diplodus* from by-catch of crystal goby fishery (previous study).

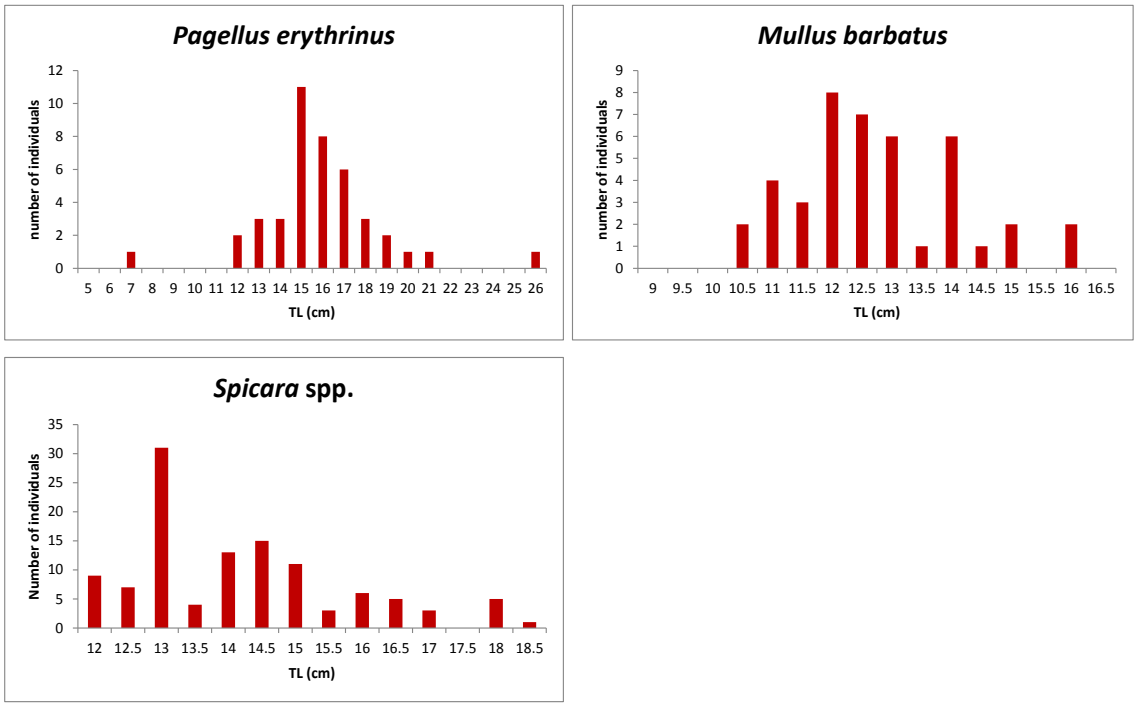


Figure 6.3.4. Length frequency distribution of *Pagellus erythrinus, Mullus barbatus* and *Spicara spp.* from by-catch of crystal goby fishery (period 2014-17).

CONCLUSIONS

Sandeel

From the 3 years (2014-2016) of the study of the monitoring established in the management plan of boat seines fishery the implementation of 800 Tm as maximum TAC is considered an adequate regulation measure.

The monthly analysis of total catches has proved to be a good control to regulate the total TAC of the 26 boats and take decisions to reduce the TAC or close temporally the fishing activity.

The mean age of the catch (< 1 yr) indicates that the sand eel fishery in the Catalan coast is fully dependent on recruitment. Results from studies carried out on the relationship SSB and R of the sand eel fishery are seen as a good reinforcement for regulation decisions of the monthly TAC.

The capture of the by-catch species of the sand eel fishery represents a negligible part of the catch, between a 2% and 8% of the total catch. Only juveniles of *Pagellus acarne* need more control effort to avoid to be captured from this fishing activity.

The sand eel population seems not to react to the conventional management of exploted stocks. The planned HCR has been strictly followed the fishery was closed accordingly in the 4th year of the establishment of the TAC. Likely this is due to the short life of sand eel that makes it highly dependent of the recruitment which does not depend on the standart management policy. The landings fluctuations could be a result not only of under- reporting, but also due to natural fluctuations of the abundance of the species. The fishermen participating in the scientific study have commented that this is the case, that there are some "good years" followed by "bad years".

The historical series of catches show a maximum of 819 tons in 2012. Since the total allowable catch was fixed at the end of 2012 in 819 tons, it can be read as the TAC was set up at the historical maximum. This is only partially true. First, the data of the years previous to 2012 were heavily underestimated due to underreported landing, as recognised by both, administrators and fishers. Second, once fixed a TAC, it cannot be larger in the following years. Actually in 2013 was a year of sand eel great abundance, and the figure of 819 tons would be greatly surpassed without the Management Plan.

The strong relationship of recruitment and the sea temperature in the previous December is promising. If actually the temperature drives the recruitment, the Management Plan must be adapted to this externality.

The Management Plan has been very efficient regarding the price regulation, with very positive socio-economic consequences.

Gobids

Regarding gobids fishery, 2001-2013 historical average catch is proposed as TAC, which provides an estimate of 1.8 tons of *Aphia minuta* and 3.8 tons of *Crystallogobius linearis*. In fact, in the last years, crystal goby has not been captured and consequently the TAC has not been reached.

The fact that the landings pattern within each fishing season is very variable, landings peak fluctuating in a variable way, with increase after decreasing and viceversa, prevents the use of depletion methods.

In any case, it is the sand eel that drive the boat seining activity; both landings and fishing days resulting from targeting gobids are very low regarding those of sand eel.

At the end, the scarcity and irregularity of data obtained makes not possible to use standard assessment methods to evaluate these species.

RECOMENDATIONS

It is advisable to maintain the fishing limitations applied during the study, for which an effort reduction to a half and a TAC was established. Furthermore monthly harvest control rules to keep the fishery under continuous observation is highly recommended, following what has been done so far.

The possibility to reduce catches during the months (March-April) of the incorporation of sonso juveniles to fishery should be taken into account during the next two years.

Recruitment variability appears to be not linked with fishing effort and its causes need further exploration. Further research on the relationships between temperature and sand eel recruitment, and hence the stock size, appears to be of paramount importance. Refinement of data (particularly other temperature data sources) and method of analysis are necessary to explore this issue.

It is suitable that the information regarding *Posidonia* be updated given that the presented information along the MP proposal could be outdated. In the same way, more control to avoid captures of juveniles of *Pagellus acarne* will be developed during the recruitment period.

The identification of seabed and characterisation of the sediment is considered an important point to be able to know the real limits of distribution of the species and develop a mapping of the potential habitat of the sand eel.

Regarding gobids fishery TAC proposed for transparent goby would be considered as adequate and for crystal goby, TAC would be maintained as a maximum, being in mind that this fishery could be restored in the future.

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doi:10.2760/681058

ISBN 978-92-79-79375-2