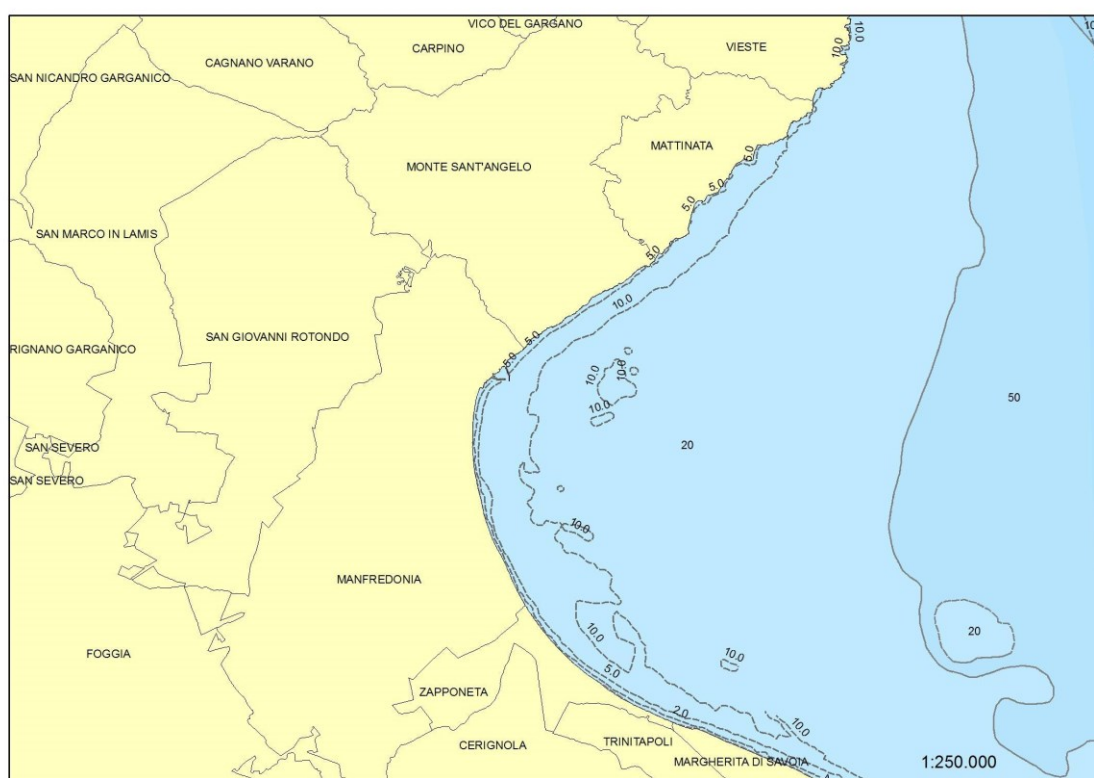


National Management Plan for derogation to mesh size and distance from the coast (reg EU 1241/2019 annex ix, part b and reg (EC) 1967/2006, art 13) regarding the fishing of transparent goby (*Aphia minuta*) by boat seines in the Manfredonia fishing district



Manfredonia – October 2024

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Contents

1. INTRODUCTION AND OBJECTIVES	4
1.1. Legal references	7
1.2. National and regional research on transparent goby	10
2. DESCRIPTION OF THE SPECIES.....	12
2.1. Classification.....	12
2.2. Morphology	13
2.3. Geographic and bathymetric distribution	13
2.4. Biology and ecology	13
3. TRANSPARENT GOBY FISHERIES IN THE GULF OF MANFREDONIA.....	18
3.1. Area of intervention.....	18
3.2. Fleet and yields of transparent goby fisheries with trawl nets	23
3.3. Socio-economic assessment.....	28
3.3.1. Context.....	28
3.3.2. Socio-economic survey.....	32
3.4. Updating socio-economic data	45
3.5. Historical biomass estimation and assessment of the level of exploitation of transparent goby stocks in the Gulf of Manfredonia	52
3.6. Current biomass estimation and assessment of the level of exploitation of transparent goby in the Gulf of Manfredonia.....	58
4. DESCRIPTION AND USE OF BOAT SEINES.....	70
4.1. Legal, historical, biological and socio-economic framework.....	70
4.2. Description of boats seines and how they are used	72
4.3. Knowledge of the gear and the fishery techniques.....	78
4.4. Experimentation: 2011-2012	81
4.5. Experimentation 2012-2013	84
4.6. Experimental campaign 2014.....	76
4.7. Experimental campaign 2015.....	82
4.8. Experimental campaigns 2018-2019-2020	85
4.9. Experimental campaigns 2022, 2022-2023, 2023-2024	95
4.10. Trend analysis last six campaigns.....	114
5 MANAGEMENT MEASURES.....	130
5.1. Fishery control.....	130
5.1.1. Fishing capacity control.....	130

5.1.2	Fishing activity control.....	131
5.2	Restrictive technical measures	131
5.3	Monitoring actions	132
5.4	Control and correction actions.....	133
5.5	Surveillance activity.....	135
5.6	Factors influencing yields and spatial monitoring.....	136
6	BIBLIOGRAPHY	145
6.1	Bibliography – publications cited	145
6.2	Legal references	149
6.3	Websites cited	151
	Annexes	152

1. INTRODUCTION AND OBJECTIVES

Transparent goby, *Aphia minuta* (Risso, 1810), is a small goby with a maximum size of 6 cm. In Italy, it used to be an important resource of small-scale fishing and was usually caught during the winter by small-scale fleets throughout the Ligurian Sea (Relini et al., 1998), Tyrrhenian Sea (Auteri et al., 1998), Adriatic Sea (Ungaro et al., 1994; Frogliola et al., 1998) and Sardinia (Cau, 2000). Other Mediterranean areas where the species was commonly caught are the Balearic Islands and the continental coast of Spain (Iglesias and Morales-Nin, 2001).

Transparent goby was traditionally fished on a small scale and near the shore both by small seines or surrounding nets without the purse line and small trawlers rigged with modified gears to fish the species (Romanelli *et al.*, 1996; Casavola *et al.*, 1999a, 1999b; Auteri *et al.*, 2000; La Mesa *et al.*, 2005). With the entry into force of Reg. (EC) n. 1967/2006, both vessels deployed seine nets, known as “boat seines”, as defined in art. 2, par. 1, ii) of Reg. (EC) n. 1967/2006, and trawl nets modified to fish the species were banned because these gears have a stretched mesh size under 14 mm. Fishery activities continued, however, during the following years after several derogations were granted (Cau, 2000), until art. 14 of Reg. (EC) n. 1967/2006 entered into force on 1st June 2010, setting the square mesh size at 40 mm and excluding any kind of exemption.

In consideration of the social, economic, and cultural relevance of traditional fisheries in some Mediterranean maritime districts, such as that of transparent goby, Reg. (EC) n. 1967/2006 does, however, allow for the continuation of such fisheries as well as other activities of socio-cultural relevance, as long as the biological and ecological sustainability of these activities is ensured by means of a specific Management Plan. In this framework, the Member State can draw up a Management Plan under art. 19 of Reg. (EC) n. 1967/2006, granting a derogation to the application of art. 9 (minimum mesh size) and requesting exemption from the application of art. 13 (distance from the coast), provided that the fishery concerned is highly selective and negligible impact on the marine environment can be demonstrated. It is not possible to request

derogations for the use of trawl fishing gears, such as trawl nets or semi-pelagic trawl gears.

Transparent goby fisheries are traditional in the Gulf of Manfredonia and represent the most important artisanal activity in the area (Ungaro *et al.*, 1994), with significant social and economic relevance at the regional level. This activity directly involves more than 250 fishers and their families. Fishing used to be carried out with bottom trawl and semi-pelagic trawl nets in the wintertime, offering a valid alternative to the exploitation of the other demersal resources.

Given the significant economic, social and cultural relevance in the recent past of transparent goby fisheries in the Southern Adriatic and particularly in the Gulf of Manfredonia, it is considered crucial to draw up a Management Plan which will allow the fleet to sustainably resume fisheries of this important resource, using the small seines or surrounding nets without the purse line.

The major selectivity of the seine net, the low impact on the non-target species as well as on the bottom communities, sea beds in particular, (Autieri *et al.*, 1989; 1996; Relini *et al.*, 1998) is the justification for the conversion from the trawl net.

Given the absence of historical data on transparent goby fishery with seine net in Manfredonia Gulf, the Management Plan forecasts the first step of three years based on the precautionary approach, taking into consideration the STECF observations published on 52nd Plenary Meeting, the available data on transparent goby different fisheries in Manfredonia Gulf and the National Management Plan on transparent goby fishery with the boat seines in GSA 9 (derogating to articles 9 and 13 of the Reg. CE 1967/2006 mesh size and distance from the coast).

The precautionary approach is given also through the monitoring process, to allow immediate actions for the protection of the species. The information collection is focused on catch data, structure, effort, fleet changes, effort changes, by-catch and socio-economic aspects.

Consequently, the measures to be adopted in the Management Plan should be proportional to the objectives of the Plan and should take into consideration the state

of the stock, the biological features of the species, the features of the fishery in question, the economic impact within the fishing areas, as described in art. 19, par. 5 of the Basic Regulation.

The objective of this Management Plan is to preserve the exploitation of this important resource through the reconversion of the fishing fleet to the use of seine nets.

Considering the actions to be taken in view of the continuation of the fishery of transparent goby in the Gulf of Manfredonia, the Management Plan forecasts some actions to guarantee resource protection and long-term commercial exploitation. In detail, the actions will be focused on:

- Reduction of the authorized fishing vessels. This will give the same opportunity to a higher number of fishermen, thanks to a turnover mechanism.
- Definition of management, reductions, and control measures.
- Definition and test of a protocol for the landing data collection in real-time, to evaluate the resource status whenever and to gain the possibility of taking some corrective measures.
- By-catch description and length frequency distribution set.
- Continuous monitor of the fishery effects on the bottom, to verify the absence of negative impacts on protected biocenosis.
- Involvement of C.I.R.S.P.E. (Italian Centre for Research and Studies of Fisheries) as a reference research institute in charge of monitoring and data validation.
- Definition of a leading group composed by Producers Organization and a local or public administration as the Manfredonia town.
- Meeting and training courses with fishermen to give them the possibility of becoming resource managers.

1.1. Legal references

Details of Italian and European legislation that regulate or have regulated transparent goby fisheries are listed below in descending order from the most recent to the less recent.

- Regulation (UE) 1241/2019 on the conservation of fisheries resources and the protection of marine ecosystems through technical measures, amending Council Regulations (EC) No 1967/2006, (EC) No 1224/2009 and Regulations (EU) No 1380/2013, (EU) 2016/1139, (EU) 2018/973, (EU) 2019/472 and (EU) 2019/1022 of the European Parliament and of the Council, and repealing Council Regulations (EC) No 894/97, (EC) No 850/98, (EC) No 2549/2000, (EC) No 254/2002, (EC) No 812/2004 and (EC) No 2187/2005.
- National Management Plan for derogation to mesh size and distance from the coast (Regulation (EC) n. 1967/2006, art. 9 and 13) regarding the use of boat seines for transparent goby (*Aphia minuta*) fishing in GSA 9. 18-8-2011, ordinary supplement n. 192 of the Official Journal general series – n. 192.
- D.D. 10/02/2015 Authorization for transparent goby fisheries.
- D.M. of 21/07/2011 – Approval of the Management Plan for transparent goby fisheries in GSA 9 replacing the directorial decree of 19/05/2011.
- Note from the Fisheries Directorate of the Italian Ministry MiPAAF of 19/01/2009 (PEMAC 0001411) - Authorization for transparent goby fisheries in the Maritime Districts of Liguria and Tuscany.
- Ministerial Decree of 22/12/2008 - Authorization for professional fishing of European pilchard juveniles and transparent goby in the waters of all Maritime Districts, excluding the Maritime District of Manfredonia, from 30th January to 30th March 2009.
- Note from the Fisheries Directorate of the Italian Ministry MiPAAF of 08/01/2007 (PEMAC 0000483) - transparent goby fishing in the Maritime District of Liguria and Tuscany.

- Ministerial Decree of 30/01/2007 - Regulations on the fishing of the European pilchard (*Sardina pilchardus*) juveniles and transparent goby (*Aphia minuta*) for the year 2007. Official Journal No. 34 of 10th February 2007.
- Regulation (CE) 1967/2006 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.
- Ministerial Decree of 12/01/2004 - Authorization for professional fishing of European pilchard (*Sardina pilchardus*) juveniles and transparent goby (*Aphia minuta*) for the year 2004. Publication details: Official Journal No. 15 of 20/01/2004.
- Ministerial Decree of 08/01/2003 - setting the period in which fisheries of European pilchard juveniles and transparent goby are allowed for the year 2003. Publication details: Official Journal No. 14 of 18/01/2003.
- Ministerial Decree of 11/01/2002 - Regulation of professional fishing of marine juveniles for human consumption and transparent goby for the year 2002. Publication details: Official Journal No. 15 of 18/1/2002.
- Ministerial Decree of 14/3/2001 - Modifications of terms pursuant to Ministerial Decrees 20th December 2000 and 12th January 2001 established for the exercise of professional fishing of European pilchard, anchovy and transparent goby juveniles. Publication details: Official Journal No. 69 of 23/03/2001.
- Ministerial Decree of 13/2/2001 - Amendments to the fishing regulation of marine juveniles for human consumption and transparent goby. Publication details: Official Journal No. 52 of 3/3/2001.
- Ministerial Decree of 20/12/2000 - Exercise of professional fishing of pilchard, anchovy and transparent goby juveniles for the 2001 fishery season. Publication details: Official Journal No. 301 of 28/12/2000.

- Ministerial Decree of 23/11/1999 - Exercise of professional fishing of pilchard, anchovy and transparent goby juveniles for the 2000 fishery season. Publication details: Official Journal No. 284 of 03/12/1999.
- Ministerial Decree of 12/11/1998 - Regulation of professional fishing of pilchard, anchovy and transparent goby (*Aphia minuta*) juveniles. Publication details: Official Journal No. 287 of 09/12/1998.
- Ministerial Decree of 28/08/1996 – Regulation of professional fishing of juveniles and transparent goby. Publication details: Official Journal No. 237 of 09/10/1996.

Part B of Appendix IX of the Reg. (EU) n. 1241/2019 sets the rules for the fishing nets minimum mesh size. For towed nets (boat seines) unlike the ones used for the direct fishery of sardine and anchovy, the minimum mesh size is 40 mm. A Member State may allow a derogation from the provisions set out in part B of Annex IX of the Reg. (UE) 1241/2019 for fishing nets which are included in a management plan as referred to in Article 19 Reg. (CE) 1967/2006 and provided that the specific fisheries are highly selective, have a negligible effect on the marine environment and are not concerned by provisions under Article 4, paragraph 5”; in this context, transparent goby fisheries with seine nets are not affected by the regulations described in art. 4, par. 5, as this activity is carried out in the proximity of, but not directly within protected habitats (e.g. it must not be carried out over meadows of *Posidonia oceanica*).

It should be noted that any such Management Plan can and must only describe fishing vessels with seine nets; trawl nets are no longer permitted according to Reg. (EC) n. 1967/2006.

1.2. National and regional research on transparent goby

- Unimar (2004). Report on experimental fishery activities targeting transparent goby in the Gulf of Manfredonia – 2003/2004 season. Final Report, 9 pp.
- Unimar (2005). Summary of research activities already carried out: experimental fishery activities targeting transparent goby in the Gulf of Manfredonia 2003/2005. Final Report, 33 pp.
- Unimar (2006). Report on experimental fishery activities targeting transparent goby in the Gulf of Manfredonia in the period November-December 2005. Final report, 14 pp.
- Unimar (2007a). Report on experimental fishery activities targeting the species *Aphia minuta*, Mediterranean Transparent goby, in the Manfredonia maritime district. November 2006 – May 2007 season. Final report, 11 pp.
- Unimar (2007b). Report on experimental fishery activities targeting the species *Aphia minuta*, Mediterranean Transparent goby, in the Manfredonia maritime district. 2007-2008 season, November - December 2007. Final report, 10 pp.
- Unimar (2008). Report on experimental fishery activities targeting the species *Aphia minuta*, Mediterranean Transparent goby, in the Manfredonia maritime district. 2007-2008 season, January – May 2008. Final Report, 10 pp.
- Unimar (2009). Report on experimental fishery activities targeting the species *Aphia minuta*, Mediterranean transparent goby, in the Manfredonia maritime district. December 2008 – May 2009 season. Final Report, 17 pp.
- Unimar (2010). Report on experimental fishery activities targeting the species *Aphia minuta*, Mediterranean Transparent goby, in the

Manfredonia maritime district. January – May 2010 season. Final report, 14 pp.

- CIBM Centro Inter-universitario di Biologia Marina (Italian Inter-University Marine Biology Centre), 2012. Training activities and the preparation of the socio-economic report and the Management Plans for Transparent goby (*Aphia minuta*) in the Manfredonia maritime district. Fisheries organization “Organizzazione dei Produttori Ittici del Sud Adriatico”. Final report 55 pp.
- Italian Centre for Fisheries Research and Studies (CIRSPE) and the Italian National Institute for Agricultural economics (2013). Management Plans for Transparent goby (*Aphia minuta*) fisheries in the Gulf of Manfredonia. Final report, 57 pp.
- Report ex Reg. (UE) n. 317/2018 “National management plan for derogation to mesh size and distance from the coast (Reg EC n. 1967/2006, art. 9 and 13) regarding the fishing of transparent goby (*aphia minuta*) by boat seines in the Manfredonia fishing district” years 2018-2019.
- Report ex Reg. (UE) n. 317/2018 “National management plan for derogation to mesh size and distance from the coast (Reg EC n. 1967/2006, art. 9 and 13) regarding the fishing of transparent goby (*Aphia minuta*) by boat seines in the Manfredonia fishing district” year 2020.

2. DESCRIPTION OF THE SPECIES

2.1. Classification

Aphia minuta (Risso, 1810) is commonly referred to in Italian as “rossetto”. It is a species belonging to the family of *Gobiidae*, which includes various benthic and semi-benthic species.

Phylum: Chordata

Sub-Phylum: Vertebrata

Super-Class: Pisces

Class: Actinopterygii

Order: Perciformes

Family: Gobiidae

Genus: *Aphia*

Species: *A. minuta* (Risso, 1810)

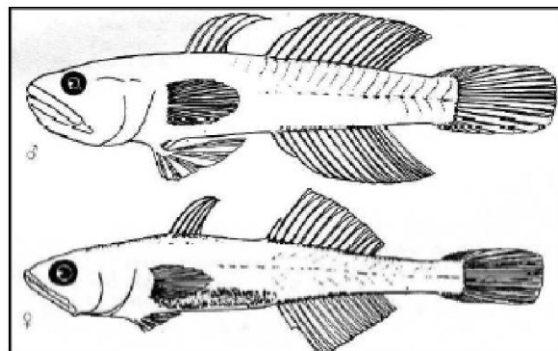


Figure 1 - TRANSPARENT GOBY, APHIA MINUTA (RISSO, 1810).

2.2. Morphology

Aphia minuta is a small species, no more than 6 cm, with a short life cycle and rapid gonad maturation. Specimens have an elongated body, with lateral compression. The melanophores are very few and the scales are cycloid, caducous and are absent between the neck and the first dorsal fin. The swim bladder is evident and persistent, while the alimentary canal is straight and short.

Adults show a white, yellowish or pink colour; the body is transparent and a few black chromophores are present. There is a red spot near the gill covers due to the blood of the gills, which are visible because of the transparency of the animal. This species shows sexual dimorphism: males have a bigger head, unequal teeth, higher caudal peduncle and the fins, especially the ventral ones, are more developed.

2.3. Geographic and bathymetric distribution

Aphia minuta is widespread in the Atlantic Sea, from Gibraltar to the Norwegian coasts, in the North Sea and the Western Baltic Sea. It is also present throughout the Mediterranean basin including the Black Sea and the Azov Sea. The transparent goby is mainly found in all the Italian seas down to a depth of approximately 80 m and it inhabits mainly sandy and muddy sea floors (Fisher et al., 1987).

2.4. Biology and ecology

The life cycle of the species is short, usually lasting only one year and ends shortly after reproduction. The biological information seems to slightly differ from one area to another: for example, in the Adriatic Sea reproduction lasts from May to August and the young specimens are caught during the winter season, though wide variations from one year to the next have been documented. In the Adriatic Sea the minimum

reproduction size of females is 28 mm while the relation between size and fertility can be expressed as follows (Frogliia and Gramitto, 1989):

$$\text{in eggs} = 2,47196 * \text{Log TL} - 0,54329 \text{ with } r = 0,95$$

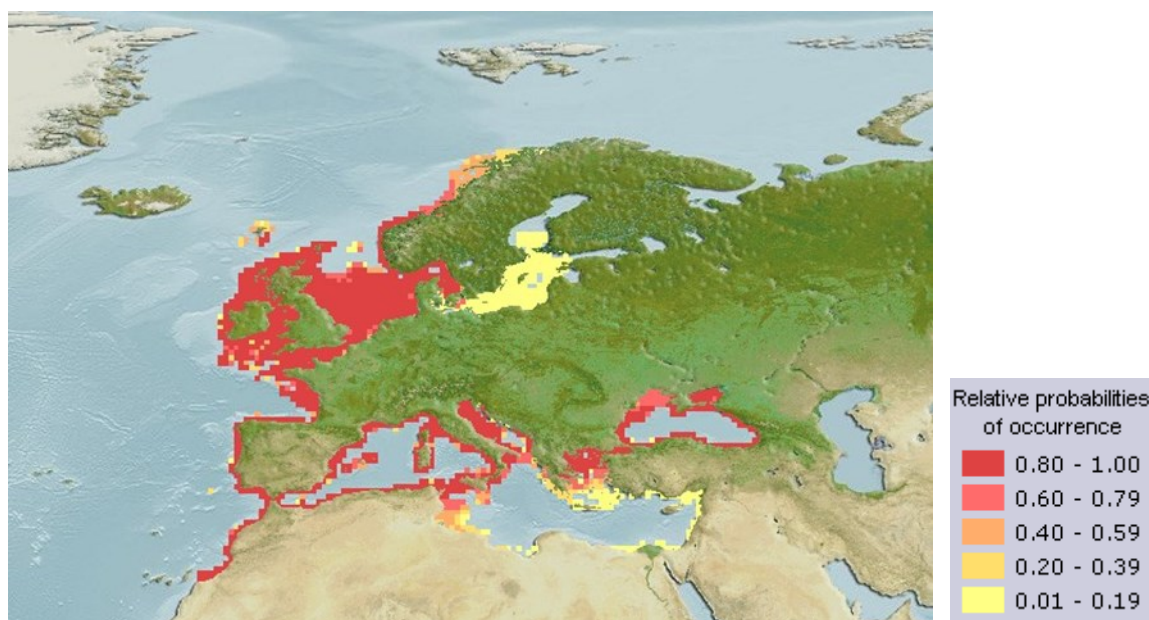


Figure 2 - DISTRIBUTION OF THE SPECIES *APHIA MINUTA* (WWW.FISHBASE.ORG).



Figure 3 - DISTRIBUTION OF *A. MINUTA* IN THE SEAS OF ITALY AND CORSICA (RELINI ET AL., 1999)

Data gathered from commercial fisheries show that catches are made up almost exclusively of females at the beginning of the fishing season (October-December), whereas the number of males increases from January onward: this is because at the beginning of the season the males are very small and therefore it is easier for them to escape the fishing gear (Serena *et al.*, 1990).

According to Froglia and Gramitto (1989), in the Southern Adriatic Sea, the average size of the population during the authorized fishing season (normally from late autumn until May) was greater than 30 mm total length (LT). This size, therefore, referred to adult individuals from the previous summer spawning season. This would suggest the presence of a related intact stock, especially in the Gulf of Manfredonia (Ungaro *et al.*, 1994).

In winter, the schools of transparent goby stay at a depth of about 4-10 m (Froglia and Gramitto, 1989), the average size of the population is about 28-30 mm, corresponding to individuals born during the previous summer. At the beginning of spring, schools move off-shore, to a depth of 20 – 40 m. Based on data from experimental surveys, size distribution in the Southern Adriatic Sea in June demonstrates a modal value of 44 mm TL and larger females (> 43 mm TL) are already mature and spawning (Froglia and Gramitto, 1989). In August, the population has two components, the first records a modal length of about 30 mm TL, the second is of 46 mm TL, which is almost entirely made up of spawning females, although mature females can be observed starting from 28 mm TL. In October, there are two peaks in the size distribution, respectively at 20 and 36 mm TL (Froglia and Gramitto, 1989).

In Tuscany, the spawning period is longer (about 6 months), starting from March-April until August-September (Autieri *et al.*, 2000). In Tuscan waters, recruitment occurs between mid-September and mid-February with an average size of recruits of 2 cm. The spawning period, and particularly its peaks, fluctuates according to variations in environmental parameters. Another hypothesis refers to spawning peaks fractionated over time, which may suggest the presence of “pulses” justifying the subsequent presence of “micro-cohorts” as described by Autieri *et al.* (2000).

In the Southern Adriatic Sea, the reproductive period is from May to August (Frogia and Gramitto, 1989; Ungaro *et al.*, 1994); examining mature ovaries under the stereomicroscope, oocytes at the same stage of development can be observed, with an average diameter of 0.4 mm. The species is probably a total spawned, depositing all gametes at the same time.

The gonad somatic ratio values are very high around mid-March when they reach 29% of body weight and this value also increases in September, when there is still a considerable presence of mature females ready to spawn (around 20%). It is likely that spawning time, in particular its peak, fluctuates according to changes in environmental parameters. Smaller recruits (1-2 cm) start to appear in April and they have even been observed at a depth of 1-1.5 m.

During its life cycle, the transparent goby demonstrates different bathymetric and spatial distribution patterns; after the larval phase, at a size of 15 mm, it goes through a semi-pelagic phase during which it tends to aggregate into shoals that are targeted by the seine nets.

When gonad maturation begins (30-40 mm), the transparent goby comes into closer contact with the seabed, reaching the demersal phase. In the event of mass-spawning in spring, by November, when commercial fishing starts, most of the specimens are larger than 35 mm and are therefore more difficult to catch using seine nets. On the other hand, if mass-spawning occurs during summer-autumn, then fishery operations take place during the aggregation phase, from November to March, ensuring more abundant catches.

Aphia minuta is a gregarious species that tend to aggregate in large shoals near the coast, probably, as a result of following the currents rich in phytoplankton. However, they have been also observed at depths greater than 50 m. The species can often be found in the proximity of the mouth of rivers and prefers sandy or muddy sea beds, or seagrass meadows.

In winter, the transparent goby tends to concentrate in coastal areas, while it moves to deeper waters (over 20 m) in the spring (Frogia and Gramitto, 1989). In the Gulf of

Manfredonia, due to the geomorphologic (shallow waters) and oceanographic features, larger aggregations can be found further off-shore, often beyond 3 NM from the coast (Casavola *et al.*, 1999).

Where feeding is concerned, transparent goby appears to be an active predator, as its morphology, dentition and behaviour suggest. Adults mainly feed on holoplanktonic organisms, mostly Copepods, Cladocerans, Mysidacea and Meroplankton, especially the larvae of Bivalves and Crustaceans and the eggs and larvae of Fish. Considering the small size and semi-pelagic life, both larvae and adults are particularly subject to predation which, together with changes in the environmental parameters, is the main cause of mortality.

Based on the biological and ecological features of the species, in the various areas where transparent goby is abundant, particularly in the Southern Adriatic Sea and the Gulf of Manfredonia, the management approach adopted to date by national administrations would appear to be correct. The fishing season was limited to winter (from late autumn to the beginning of spring); in this period the population is mainly made up of adults born during the previous spawning season (spring-summer, according to Frogliola and Gramitto, 1989).

3. TRANSPARENT GOBY FISHERIES IN THE GULF OF MANFREDONIA

3.1. Area of intervention

The Gulf of Manfredonia is a wide bay in the Southern Adriatic Sea, between the Gargano promontory in the North and the mouth of the Ofanto river to the South.

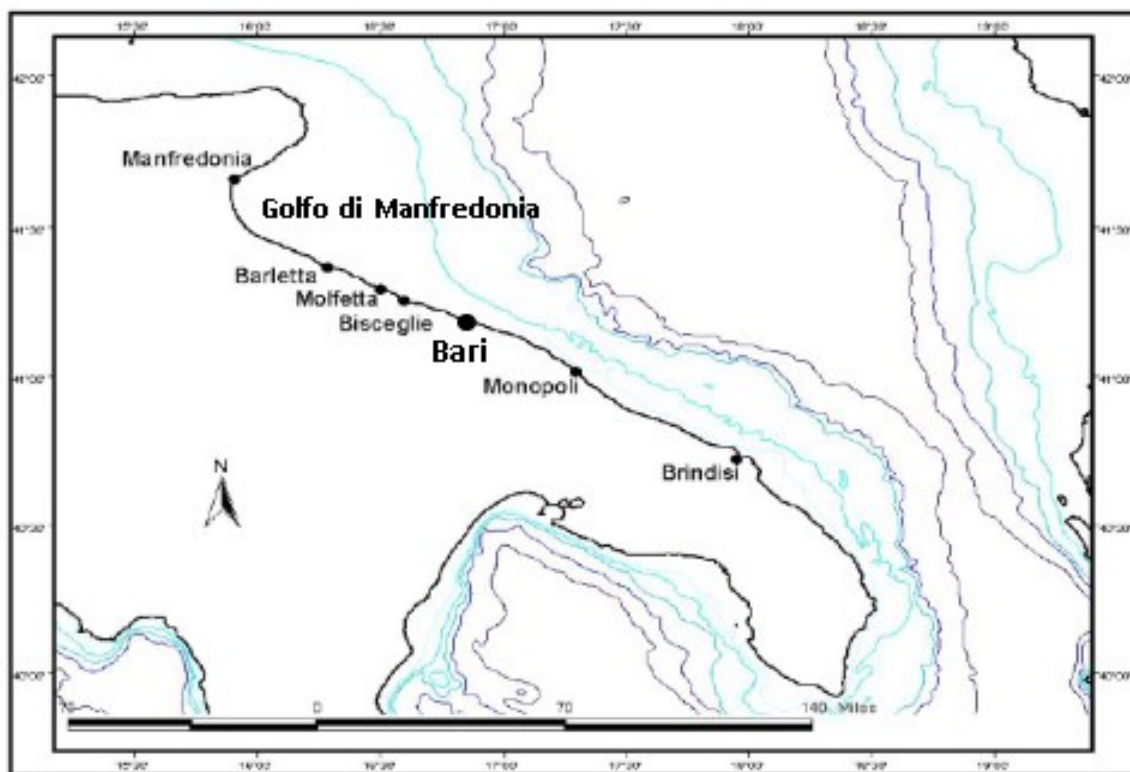


Figure 4 - The Southern Adriatic and the Gulf of Manfredonia

This wide area of sea is part of the FAO-GFCM geographical sub-area 18 (GSA 18 Southern Adriatic Sea) and includes the area between $41^{\circ} 50'$ and $40^{\circ} 04'$, with a bathymetric range between 10 and 800 m and a total area of 24 008 km².

Where the bathymetry is concerned, GSA 18 can be divided into two levels: the first one (continental shelf) is between a depth of 10 and 200 m and at 16449 km² covers about 70% of the area. The second one (continental slope) is between a depth of 200 and 800 m and covers about 7559 km² (the remaining 30%). The maximum depth of

GSA 18 is 1233 m in the “Fossa di Bari”, a moderately asymmetrical depression in the sea bed, in which the Eastern side is steeper.

In the whole GSA 18, the fishing grounds that are potentially exploitable with bottom trawl nets cover about 17000 km² (70% on the Western side and 30% on the Eastern side). The area in which it is possible to use trawl nets increases from the South to the North of the basin, reaching a peak in the Gulf of Manfredonia.

The Southern Adriatic basin is connected to the Ionian Sea through the Strait of Otranto. Circulation of the water mass in the Southern Adriatic Sea is cyclonic (Artigiani *et al.*, 1977). Dense waters from North Adriatic (NADW, Northern Adriatic Dense Water), ADP (Adriatic Deep Water) and LIW (Levantine Intermediate Water) coexist in the area. Cold NADW waters move from North to South along the Western continental shelf, deep ADW waters generate in the Southern Adriatic depression; warmer and saltier waters (LIW) flow towards the North on the Eastern side of the Adriatic (from the Ionian Sea to the Strait of Otranto). Eastern waters are therefore warmer than the Western ones (Artegiani *et al.*, 1997). The surface current on the Western coast drives Adriatic waters towards the Ionian Sea.

The average salinity of the basin is 38.5 ppt. The Levantine Intermediate Water in the South-East has a salinity of 38.75 ppt (the temperature is 13,7 °C), deep waters have an average salinity of 38.65 ppt (temperature: 13,3 °C). On the surface, the water temperature ranges between 28-29°C in the summertime and 9-11°C in winter.

Demersal resources of the Southern Adriatic Sea are exploited by both the Italian and the Albanian fleets, which operate on the same stocks.

According to effort distribution estimates, the Italian fleet that operates in the Southern Adriatic Sea consists of about 4.000 vessels; about 44% of the vessels operate using passive, polyvalent systems, 43% use trawl gear, 7% are dredgers, 3% longliners, 3% mid-water trawlers and 1% seiners. Where catches are concerned, anchovy (*Engraulis encrasicolus*) represents about 32% of landings, hake (*Merluccius merluccius*) 14%, European pilchard (*Sardina pilchardus*) 6% (Lembo *et al.*, 2010; Irepa, 2011).

The scientific research carried out in the Southern Adriatic Sea also confirms the importance of small pelagic species in terms of biomass, especially in coastal areas (10-200 m depth, continental shelf). According to these surveys, European pilchard, *S. pilchardus* and anchovy, *E. encrasicolus*, appear to be the most important species in terms of biomass on the shelf floor, with average yields of 20 and 17.5 kg/km² (Lembo *et al.*, 2010).

Where demersal species are concerned, hake *M. merluccius* (49 kg/km²) and red mullet *Mullus barbatus* (15 kg/km²) appear to be particularly abundant. Extremely high yields have been observed in cephalopods, particularly squid *Illex coindetii* (33 kg/km²), lesser octopus *Eledone cirrhosa* (18 kg/km²), common octopus *Octopus vulgaris* (12.5 kg/km²) and musky octopus *Eledone moschata* (10 kg/km²) (Lembo *et al.*, 2010).

In the Southern Adriatic Sea, in particular in the shallow waters of the Gulf of Manfredonia, bivalve molluscs (mainly clams) play an important role (Vaccarella *et al.*, 1998; Irepa, 2011).

From a geo-morphological point of view, the coastal area of the Gulf of Manfredonia, which extends for about 60 km, is rocky in the North and sandy elsewhere, with some short stretches of marshy coast in the middle where the rivers Candelaro, Cervaro, Carapelle and Ofanto meet the sea. There are several towns on the coast, Manfredonia is the largest.

In the Gulf of Manfredonia, the seabed is regular, and the continental shelf is quite wide: the 50 m isobath is located about 20 km from the coastal line. At a depth of 10 m and beyond, marine sediments are mainly composed of kaolinite-smectite (Ferretti *et al.*, 1984). River sediments from Carapelle and Ofanto are not coarse, the absence of sandy deposits at the river mouths is mainly due to the coast morphology and the number of clay formations of the river basins (Ambrosano *et al.*, 1986). Between Manfredonia and Zapponeta, from the coast towards the open sea, marine sediments gradually go from fine sand (0.13-0.18 mm grain size) to clay (<0.06 mm grain size); at the 5 m isobath, the presence of large quantities of clay makes a sort of cenocline,

with the passage from SFBC biocenosis (fine sands well-calibrated), to VTC (coastal terrigenous mud). There is a drastic reduction in *Chamelea gallina* beyond the 5m isobath (Vaccarella *et al.*, 1998).

In the Southern part of the Gulf of Manfredonia, between Zapponeta (Manfredonia Maritime District) and Margherita di Savoia (Barletta Maritime District), the sandy area extends further off-shore, increasing in grain size from 0.2 to 2.0 mm (coarse sand) which are replaced at a depth of around 15 m by a seabed characterised by maerl (DC/m) and pralines (DC/pral.) (Vaccarella *et al.*, 1998).

As reported in the document “Inventario e cartografia delle praterie di Posidonia nei Compartimenti Marittimi di Manfredonia, Molfetta, Bari, Brindisi, Gallipoli e Taranto” published by Puglia Region (POR Puglia 2000-2006), **the *Posidonia oceanica* in the Manfredonia Maritime District is recorded exclusively along the coasts NE and SE of the San Domino island, part of the Tremiti arcipelago.**

Also, the chart below (Figure 5) representing data from EMODnet, updated in 2019, confirms the absence of Posidonia meadows in the area.

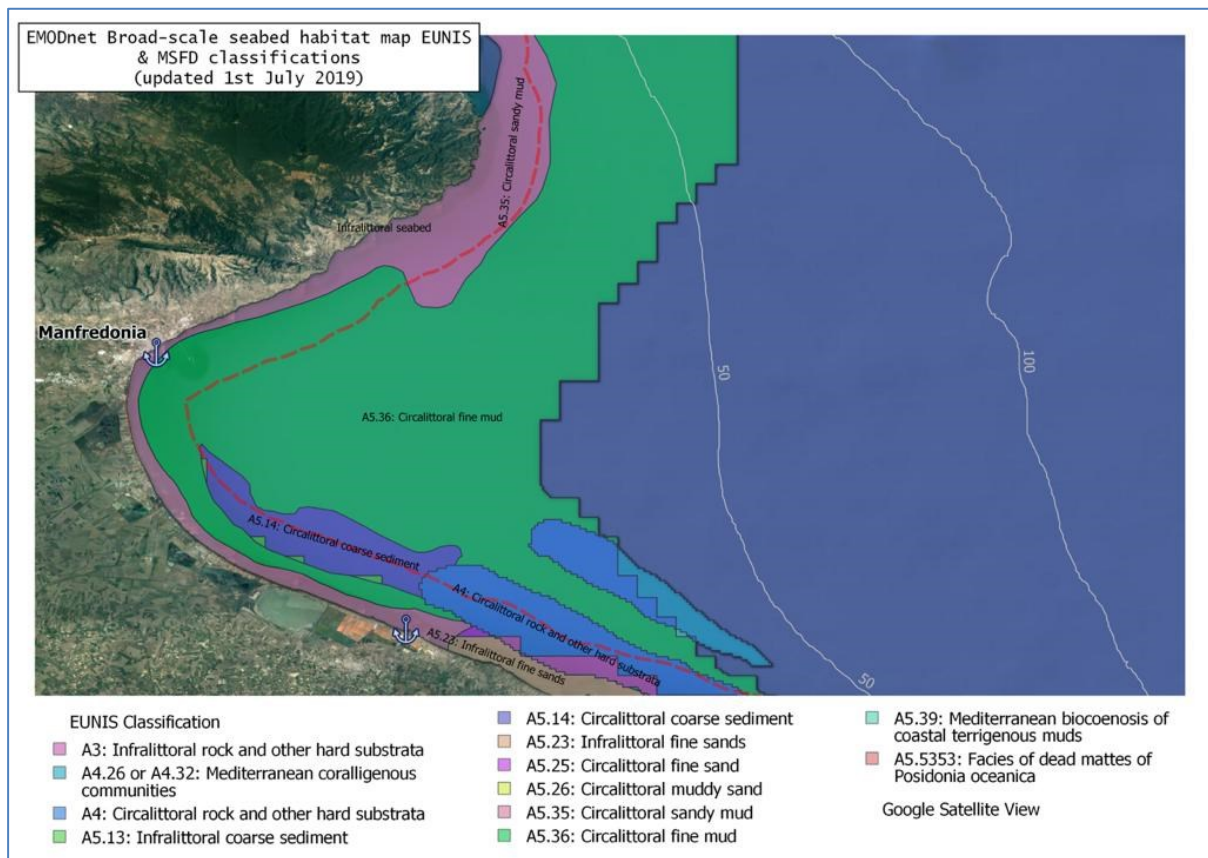


Figure 5 - EMODnet updated in 2019. Manfredonia Gulf

From an oceanographic point of view, the Gulf of Manfredonia represents the transition area between the Central-Northern Adriatic flow and the Southern Adriatic flow (Spagnoli *et al.*, 2008; Focardi *et al.*, 2009). In the Gulf the flow is influenced mainly by the wind direction: cyclonic and anti-cyclonic currents are respectively induced by North-West and South-East winds.

The Gulf of Manfredonia is a sheltered area with eutrophic waters. Biochemical and hydrologic features of the Gulf are affected by the morphology of the coast and by the rivers, mainly the river Ofanto, which is the most important in terms of flow South of the Gargano promontory, as well as some other minor rivers (Carapelle, Cervaro and Candelaro) which give a limited, seasonal contribution in terms of transport and input of sediments (Spagnoli *et al.*, 2008).

Consequently, the Gulf of Manfredonia represents a complex system under the influence of several potential risk factors, mainly due to inland human activities (industrial, urban, agricultural) (Fiesoletti *et al.*, 2005).

3.2. Fleet and yields of transparent goby fisheries with trawl nets

In past years, in the Adriatic Sea, several fleets targeted adult specimens of small-sized species, essentially transparent goby (*Aphia minuta*) (Casavola *et al.*, 1999a, 1999b). However, over 90% of the fishery products were caught and traded by the vessels in the Gulf of Manfredonia, where about 200 vessels were registered in the related. These vessels, varying in number from year to year, were authorized on a seasonal basis to fish transparent goby. This fishery was made possible through a derogation granted by the Italian Ministry of Agriculture, Food and Forestry Policies, which regulated the fishing season to reduce the impact on non-target species and the coastal benthic communities. The main law governing these activities was established by the Ministerial Decree of 28th August 1996 that established rules on the fishing of juvenile specimens for human consumption, (in particular art. 1, paragraph 3), and by Legislative Decree no. 29 of 3rd February 1993 and subsequent amendments, including the Ministerial Decree of 12th January 2004, and given Regulation (EC) n. 2287/2003, Annex IV: transitional technical measures - paragraph 9 (technical conservation measures in the Mediterranean), temporary continuation of fishing activities was permitted under a waiver based on the article 3, paragraphs 1 and 1-bis, and art. 6, paragraphs 1 and 1-bis of Regulation (EC) n. 1626/94. The fishing season was generally set in the late autumn (November-December) until March-May; sometimes from January to March (Romanelli *et al.*, 1996; Casavola *et al.*, 1999a, 1999b; Auteri *et al.*, 2000, Romanelli and Giovanardi, 2000 La Mesa *et al.*, 2005; Various Authors, 2010).

Transparent goby fisheries were carried out in coastal waters, including the area within three miles from the coast, on sandy-muddy bottoms at depths between 3 and 40 m, using trawl nets similar to traditional ones, but with very fine mesh size

(Casavola *et al.*, 1999a). This fishery was carried out at depths of less than 12 m during the winter and at greater depths (20-40 m) during the spring (Frogliia and Gramitto, 1989).

Table 1 contains a summary of information relating to fishing activities carried out by the Manfredonia transparent goby fleet from 1996-2010. In particular, it shows the number of vessels authorized to carry out the activity, the average annual number of fishing days for each authorized vessel, the quantity of transparent goby landed by each authorized vessel, the selling price per kilogram (expressed in Italian Lira until 2001 and converted into euros) and the total daily amount (including other species caught) landed by each vessel. The data have been extracted from the results of specific monitoring activities carried out by the Italian Consortium Unimar and commissioned by MIPAAF, as well as data from IREPA (Italian Institute for Economic Research on Fisheries and Aquaculture).

Where trawl fisheries in the Manfredonia area are concerned, transparent goby was a significant part of total landings (30-40%). Figure 6 shows the trend from 1996 to 2010 in the average daily catch per authorized vessels. The data in Table 1 were processed without taking into account the amounts reported for November-December 2005, as this was only a two-month period and therefore referring to an entire year or fishing season. As shown in Figure 6, transparent goby catches remained fairly stable throughout the period investigated, around an average of 19 kg/day/vessel. These yields demonstrate the abundance of the resource in the area.

Figure 7 shows the trends in total landings of transparent goby by vessels from Manfredonia: these estimates were calculated by multiplying the number of vessels authorized to fish by the average number of days per vessel and for the mean yield per vessel (kg/day/vessel).

High landings recorded in the period 1996-97 and 2007 are due to the larger number of vessels authorized to fish transparent goby. In the period 1996-97, the number of vessels authorized was, respectively, 132 and 130; in 2007 there were 70, while in the rest of the period investigated there were 50, fluctuating in various years.

Table 1 - Summary of transparent goby fishing activities carried out by the Manfredonia fleet from 1996-2009/2010 (processed by CIBM, 2012 from Unimar and IREPA data).

Period	Authorised vessels	Average values per vessel			
		Days	Transparent goby (kg)	Price (kg)	Total catch (kg)
1996	132	69	19.0	14.98	54.0
1997	130	75	25.0	14.46	67.3
1998	50	93	12.0	11.88	48.0
1999	50	55	19.0	13.95	61.2
2000	50	70	25.0	12.66	58.8
2001	50	86	18.0	16.53	47.0
2002	50	64	23.0	20.00	59.5
2003 - 2004	50	62	18.7	21.00	50.0
2004 - 2005	50	91	16.2	22.50	46.0
Nov - Dec 2005	50	42	18.5	22.00	45.7
2006 - 2007	50	81	13.9	27.00	39.6
2007 - 2008	70	103	15.7	24.00	51.8
2008 - 2009	50	108	24.0	21.00	61.0
2009 - 2010	50	79	18.3	20.50	43.2

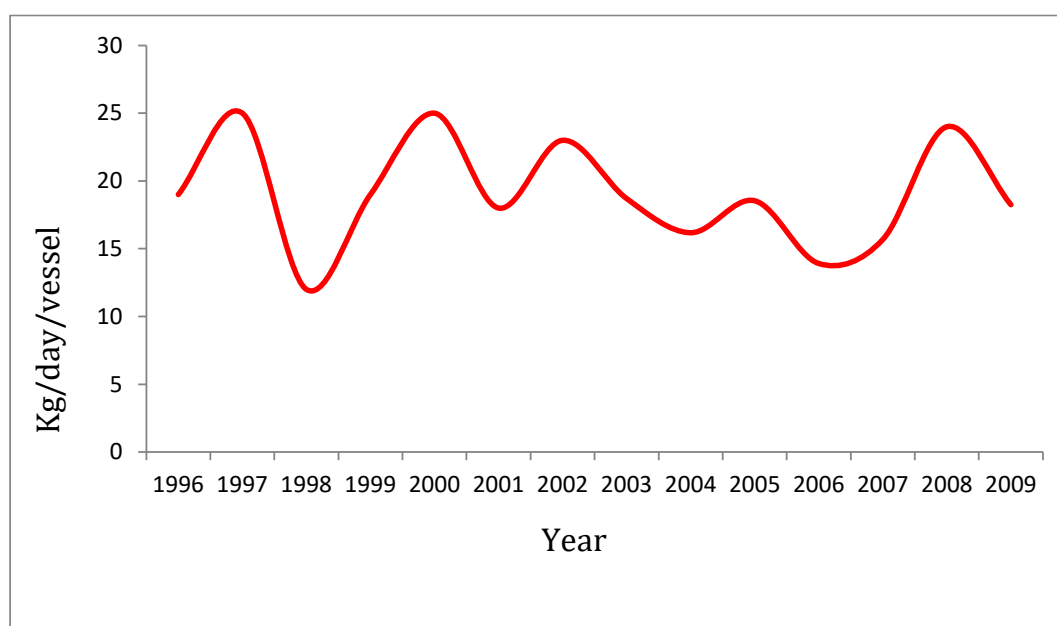


Figure 6 - Average daily catch trends per vessel (kg/day/vessel) for transparent goby in the Manfredonia district (1996 - 2010) (source CIBM, 2012)

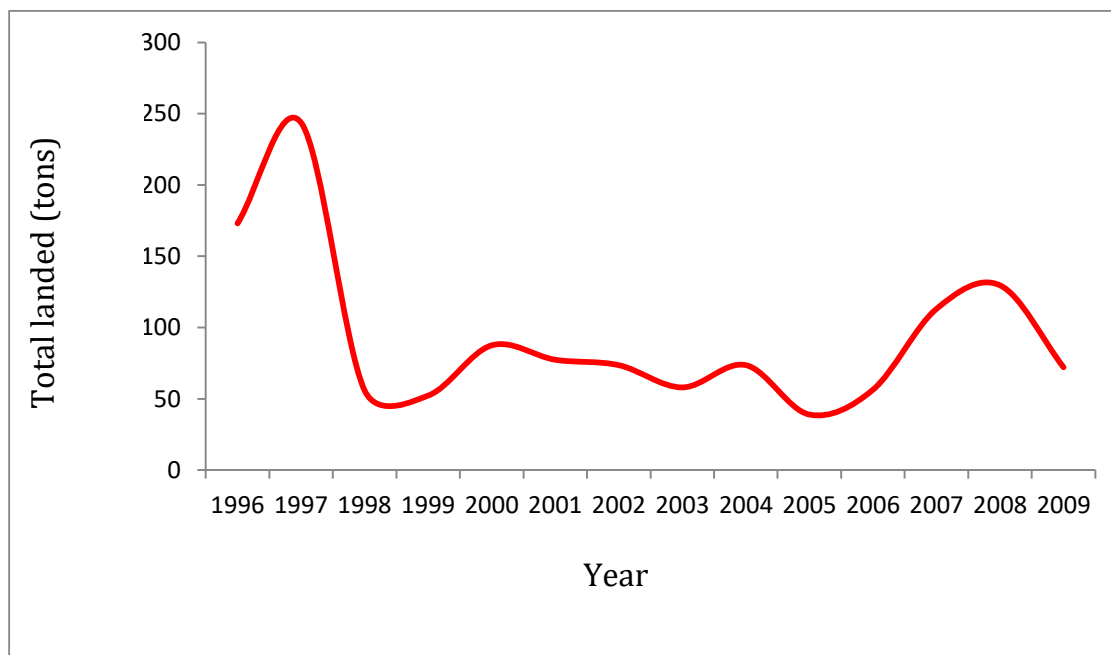


Figure 7 - Total landing trends (in tons) of transparent goby by the vessels in the Manfredonia fleet licensed to fish (1996-2009) (source CIBM, 2012)

The same trend in total landings is also shown by the number of fishing days per year of the Manfredonia fleet (Figure 8), obtained by multiplying the average number of fishing days by every single vessel by the number of licensed vessels. This information provides a measure of fishing effort, in terms of activity, exercised on the resource. The total number of fishing days for the fleet ranged from a minimum of 2750 days in 1999 to a maximum of 9750 days in 1997, with an average value over the whole period of 5039 days per season.

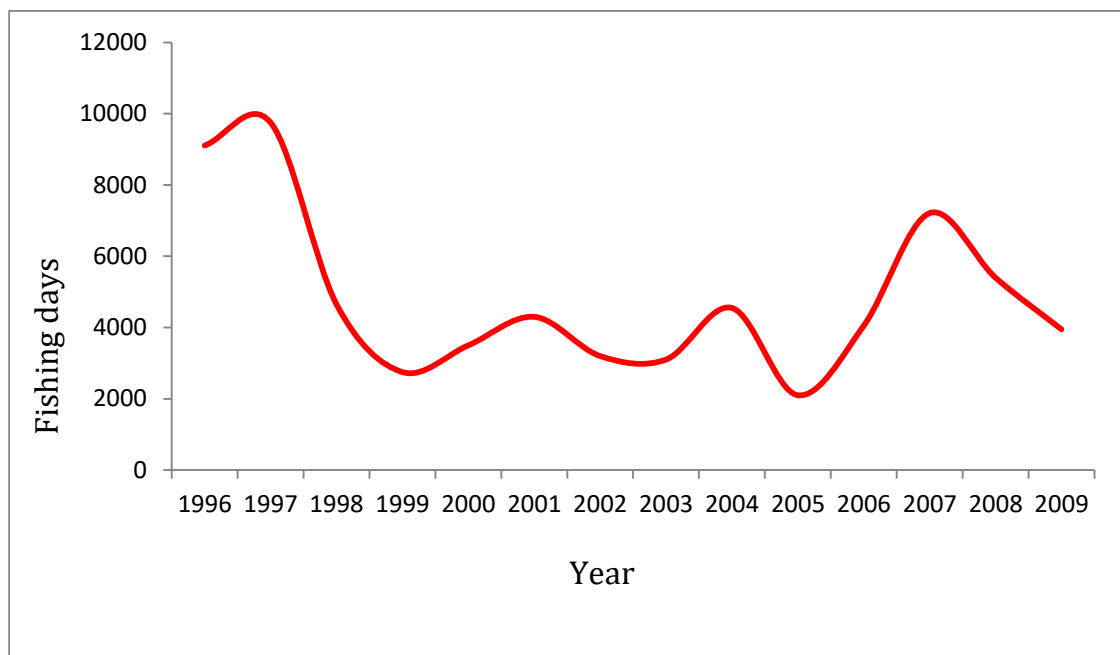


Figure 8 - Trends in fishing effort for transparent goby in terms of total fishing days (source CIBM, 2012)

Transparent goby catches from trawl fisheries, although significant in terms of weight, represented between 30% and 50% of the total catch (Table 1), demonstrating low selectivity of this fishery, in which there was a significant amount of by-catch (both marketable species and discards). This evidence comes both from monitoring activities conducted by Unimar and from other studies carried out in the Gulf of Manfredonia, with the aim of reconstructing the specific catch composition of fisheries targeting Transparent goby with trawl gears (Casavola *et al.*, 1999a; La Mesa *et al.* 2005).

By-catch was made up for the most part of juveniles and adults of European pilchard, *Sardina pilchardus*, and anchovy, *Engraulis encrasicolus*, which together made up about 40% of the total catch. The rest of the by-catch was small goby (adult specimens) of the genus *Pomatoschistus* and Sparidae, such as Salema porgy, *Sarpa salpa*, annular seabream, *Diplodus annularis*, common pandora, *Pagellus erythrinus*, etc. Catches also included cephalopod molluscs (common squid, *Alloteuthis* spp., and bobtail squid, *Sepiola* spp.), as well as crustaceans (Decapods, Gastropods, Amphipods and Mysidacea).

3.3. Socio-economic assessment

3.3.1. Context

Transparent goby fisheries are part of the history and culture of many local fishing communities. The need to pursue economic and social objectives, in consideration of the social and cultural significance of this fishery, is in line with the European Commission's objective to protect small-scale fishing, tradition, selective fishing and exploitation of local products.

Transparent goby fisheries were particularly important for the Manfredonia fleet both due to their profitability (consenting adequate earnings for single-income families in which the sole breadwinner engaged in coastal fishing) and also for their high cultural relevance.

The seasonal nature of this fishery also allowed small boats to achieve a significant level of income while relieving fishing pressure on other resources.

The boats authorized to fish Transparent goby fell into the category of small-scale trawlers (vessels with an overall length of less than 15 meters); in the Manfredonia maritime district, there were about 290 trawlers with a LOA <15 and of these between fifty and one hundred, depending on the year, practised Transparent goby fisheries in the winter months.

Table 2 shows the main socio-economic indicators of the small-scale trawlers operating in Manfredonia, which also includes the boats that targeted transparent goby. The trawl fleet represents an extremely important productive sector for the Manfredonia fishing fleet, not only for a large number of boats (just under 300) but also for the revenue (52 million euro); average fishing days were 158/year, with daily catch per vessel at about 163 kg with a turnover of about one thousand euros.

The daily catch of transparent goby was between 14 - 24 kg in the period 2004-2010 and provided daily earnings of approximately € 400. In the Manfredonia area, where these fisheries were practised for decades, its importance was strongly linked to high consumer demand for fresh produce, which led to very high average prices.

Table 2 - Principle indicators of production and turnover of the trawl fleet - LOA <15 m in the Manfredonia maritime district, 2010 (source: MIPAAF-Irepa).

Manfredonia maritime district	trawlers LOA <15 m
Number of vessels	288
Fishing days	45 523
Total catch (kg)	7 397 946
Total revenue (€)	52 044 416
Average production price (€/kg)	7.03
Daily catch per vessel (kg)	163
Daily revenue per vessel (€)	1 143
Fishing days per vessel	158
Annual catch per vessel (kg)	25 656
Annual revenue per vessel (€)	180 487

The turnover from transparent goby fisheries was, however, highly variable from year to year, it depended on the abundance of the resource, the average price and the duration of the fishing season; the latter was established by specific ministerial decrees however, the actual number of fishing days was influenced by weather conditions which are not always favourable in the winter months.

The total annual revenue of transparent goby fisheries was significantly higher than that of the other species caught during the periods when transparent goby fisheries were not allowed, or in the same fishing season by vessels that alternated the fishing gear used.

If the average daily income of small-scale trawl vessels is considered (about one thousand euro), the daily turnover from transparent goby fisheries accounted for 35% of total income, with peaks of 50% in some fishing seasons. High average prices

influenced these values, in particular for the transparent goby (about 20 €/kg, compared to an average of about 7 €/kg of the product landed by small trawl vessels) (Table 3).

Table 3 - Average daily revenue per vessel and production prices for transparent goby 2004-2010 (Source: CIBM, 2012).

	catch/day per vessel(kg)	Production prices (€/kg)	revenue/day per vessel(€)
2004-2005	16.2	22.50	364.50
Nov.- Dec.2005	18.5	22.00	407.00
2006-2007	13.9	27.00	375.30
2007-2008	15.7	24.00	376.80
2008-2009	24.0	21.00	504.00
2009-2010	18.3	20.50	375.15

In the absence of a specific derogation to allow transparent goby fisheries to be implemented in the future, the boats which are currently licensed would see their revenue substantially reduced, with negative repercussions from a social and occupational point of view. In addition, the severe crisis that is affecting the entire fishing industry further worsens the profit margins for fishing enterprises. Taking into consideration the trawl fisheries sector alone, it has been estimated that between 2010 and 2011 vessels with LOA <15 meters that operate in the Manfredonia maritime district lost more than 30% of their gross profit. The stagnation of prices and, in particular, the drastic increase in operating costs (the cost of fuel has risen from an average of 0.59 €/litre in 2010 to 0.70 €/litre in 2011) are at the root of the steady decline in profitability of the sector. In this framework, the coinciding loss of the high revenue from transparent goby fisheries has greatly amplified the situation of economic and social distress which characterizes the entire Manfredonia fishing fleet.

Figure 9 shows the trends in average revenue per vessel for the Manfredonia fleet licensed to fish transparent goby.

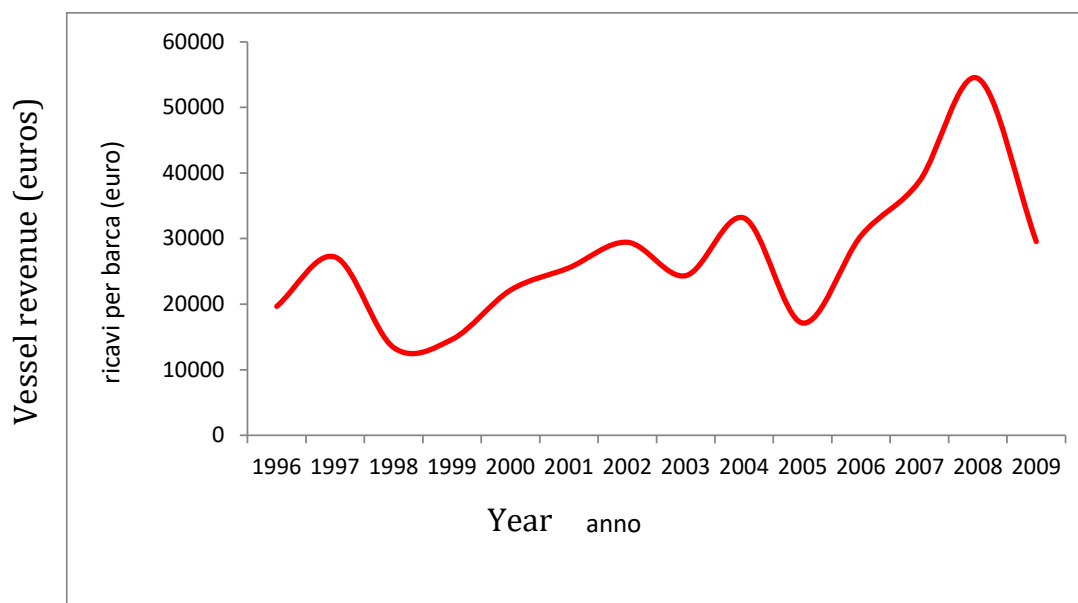


Figure 9 - Revenue trends in euro per vessel from transparent goby fisheries (Source CIBM, 2012).

These data were obtained by multiplying the average sales price of transparent goby for the average yield (kg/day/vessel) by the average number of fishing days. The average revenue of the boats authorized to fish transparent goby show a positive trend, except for the reduction between 2009, the maximum point in the period investigated, and 2010. This is not due to an increase in average yields, which have been shown previously to be relatively stable over the period investigated, but rather to an increase in average selling prices, which rose from about 15 euro/kg in 1996 - 2000, to values well over 22 euro/kg in recent years.

Taking into account data for the entire period investigated, transparent goby shows an overall average price of about 19 euro/kg.

It is therefore a resource with a high economic value which represented an important part of the annual turnover for each vessel. It should also be noted that this fishery, which is mainly carried out during the winter in coastal waters, as well as consenting to the exploitation of an alternative resource at a time when conventional resources were less plentiful, allowed fishermen to increase their quality of life as well as their security.

3.3.2. Socio-economic survey

To effectively collect consistent and reliable data on the socio-economic aspects of the Manfredonia fishermen engaged in the catching of transparent goby, a survey was prepared targeting various actors involved.

The research took the form of interviews with fishermen, with the proposal of special questionnaires aimed at collecting information on the following aspects of their activities:

- quantity of catch of the entire fishing season (late autumn, May);
- average selling price of the product at the fish market;
- number of people employed in the activities of the fishing enterprises;
- employment prospects in case of loss of the fisherman's job;
- any requests to improve working conditions on board and on land.

This analysis benefitted from the experience acquired by the INEA (Italian National Institute for Agrarian Economics) working group in the definition of the methodology followed in the framework of the management plan for Transparent goby fisheries in GSA 9¹ (the Ligurian Sea and Northern Tyrrhenian Sea) and produced an interesting socio-economic framework of the fishermen social status in Manfredonia. The survey shows that the work and employment destiny of the workers goes hand in hand with the availability and marketing of the target species, in a framework of considerable socio-economic fragility, indeed a short period of scarcity of fish is enough to place the operator, and his family, in a condition of economic insecurity.

1

Reg. (EC) of 4th October 2011, n. 988/2011, containing the derogation to Reg. (EC) n. 1967/2006 of the Council concerning the minimum distance from the coast and the depth for seine nets deployed from vessels targeting transparent goby (*Aphia minuta*) in those Italian territorial waters (GSA 9).

Mediterranean fishing is characterized by a strong traditionality that over the centuries has consolidated the relationship between man and the harvesting of fish resources according to their availability in maritime spaces. In Manfredonia, this man-sea connection has taken concrete form in a specific type of fishing such as the transparent goby, which has allowed the local community to develop a fishing economy that has contributed significantly to supporting employment.

Thus, for several years now, transparent goby fishery in Manfredonia has remained a profitable and sustainable activity, since it targets a species, whose specific biology exhausts its life cycle in about a year, and which only comes close to the coast, when it can be caught, in the period between late autumn and the following May, remaining for the other months outside the fishermen's range. This traditional character of transparent goby fishery should therefore not be confused with an activity of the past, no longer sustainable way of fishing. On the contrary, it should be protected and promoted as an example of good practice of small-scale fishing for its combination of respect for the seasonality of the fish stock and its limited harvesting in time but strategic for the sustenance of a local economy.

The fleet of the Manfredonia Maritime District

The fleet of the Manfredonia Maritime District counted 495 vessels in 2013 and 450 in 2021 (source: Fleet register).

Table 4 - Fleet characteristics: Manfredonia Maritime District, 2021

	Vessels	Tonnage	Length (LOA)	Engine power
	n.	GT	metres	kW
Manfredonia Fleet	450	11,00	10,60	66,78
- which target Transparent goby	80	14,07	12,86	92,63
% vessels T goby / Manfredonia fleet (%)	17,7			

SOURCE: ELABORATION BASED ON THE COMMUNITY FISHING FLEET REGISTER, CFR SEARCH (JANUARY 2021).

The analysis of the fleet according to the main gear shows that most of the boats are equipped with trawl gear (41.33%).

Table 5 - The Manfredonia Fleet by main gear type, 2021.

	Vessels
	n.
Hooks and lines	58
Dredgers	51
Gillnets	149
Trawl nets	186
Seine nets	6
Total	450

SOURCE: ELABORATION BASED ON THE COMMUNITY FISHING FLEET REGISTER, CFR SEARCH (JANUARY 2021).

Table 6 - The Manfredonia Fleet by main gear type, (%).

	Vessels
	%.
Hooks and lines	12.89
Dredgers	11.33
Gillnets	33.11
Trawl nets	41.33
Seine nets	1.33

SOURCE: ELABORATION BASED ON THE COMMUNITY FISHING FLEET REGISTER, CFR SEARCH (JANUARY 2021).

The objective of this proposal is the prosecution of fishing activities, started with the reconversion of vessels that previously targeted this species with other gears (mostly trawl gear) to the use of seine nets. The information required for the development of the two cognitive frameworks is acquired using a specific socio-economic questionnaire, formulated by the working group CIRSPE-INEA and presented in Annex 1. To carry out the study on the economic impact of the measures on the fisheries activities in question², it was considered necessary to:

1. Acquire knowledge on the current situation related to experimental fishery activities for transparent goby: the first section of the

² Letter d), paragraph 5, art. 19 of the Mediterranean Regulation.

questionnaire focuses on the activity of individual vessels, the data required are general relating to the boat, the skipper and the vessel;

2. Acquire knowledge on the previous situation, concerning transparent goby fisheries with trawl nets: the second section of the questionnaire aims to analyse information relating to fishing activities carried out in the years 2009 and 2010 by the cooperatives and fishery enterprises that continued to fish transparent goby in the experimental phase that has just ended.

The purpose is to try to evaluate and quantify the economic impact of the measures on fishing activities through the establishment of economic and social indicators.

Following the guidelines in the relevant EC legislation, the questionnaire was structured to survey the vessels. Considering that the majority of boats licensed to fish transparent goby has ownership that differs from the vessel owner (this is the case for workers' cooperatives³), the questionnaire was divided into two parts:

- One for the fisher, in this case, the vessel's "captain",

³ Fisheries Cooperatives consist of fishers who wish to pursue jointly, with their own means or with those of the cooperative, fisheries and fish farming (both freshwater and marine aquaculture), or activities related to fisheries (such as purchase, maintenance and reselling tools, storage and sale of the products). Fisheries cooperatives are aggregations of fishers or fishing companies that are joined together to unite their energies in work and production in order to increase their bargaining power against the "market". There are the following two main types of cooperative: the first is a "worker cooperative" that manages the fishing vessels and the work done by the members, which is comparable to standard contractual employment, the other being "services cooperatives" which associates fishing companies operating fishing vessels independently and which provide various types of services to members such as: fish market, supplies on board, administrative assistance. There are also "mixed cooperatives", where both types of activity are present.

- The other for the vessel owner

The captain is asked to provide information of a personal nature, the vessel owner is asked for information relating to income for each fishery, prices, markets and costs. If the questionnaire is addressed directly to the fisher, he cannot know, except by hearsay, which is the target market. The fisher, in general, delivers fish to a cooperative or a wholesale warehouse and has no information about the final destination of the product. Similarly, in the case of worker cooperatives, revenues and costs are the sole responsibility of the cooperative, the fishermen are employed and their income depends on the general growth of the cooperative and not on the single species captured.

As well as the survey of indicators, the research also provided an opportunity to identify additional characteristics of the socio-economic context to highlight the role of transparent goby fisheries in the area.

For the socio-economic questionnaire, it was decided to inform the cooperatives and fishing enterprises on the purpose of the investigation and then send them the questionnaire with the name of the vessel and the EU number; the cooperatives and companies then returned the questionnaires to the researchers.

The collection of information was, however, hampered by the insufficient data for each vessel, or at least the ability to access data, as well as the fact that often the boats changed cooperative membership, and some cooperatives were only active for a short time. This situation makes it difficult to reconstruct the historical series of economic data necessary for a precise evaluation.

The cognitive investigation was therefore carried out after the conclusion of the experimentation and involved all the vessels targeting transparent goby. The information gathered concerns over 80% of the total, so it is possible to draw some conclusions. The survey also produced some interesting results and raised some points upon which to reflect for the continuation of the work.

Up to the month of August 2013, the following questionnaires were returned:

- n. 84 questionnaires completed by the cooperatives and fishery enterprises concerning individual fishing vessels concerning the period from February to April 2013
- n. 11 questionnaires about the years 2009 and 2010.

Table 7 - Socio-economic questionnaires compiled (n.).

cooperatives/fishery enterprises	Section A) February-April 2013	Section B) 2009-2010		
		2009	2010	Total 2009-2010
Guerra Snc	2	1		1
I Pescatori di Manfredonia	4			
La Bussola	16	1	1	2
Michelangelo	1	1	1	2
Oceania	15	1	1	2
Papa Giovanni XXIII	13	1	1	2
San Pio	13			
Stella Maris	11	1	1	2
Universo	9			
Total	84	6	5	11

The main conclusions of the processing related to the completed questionnaires are shown below. It should be noted, however, that not all the required information is available, either because they sometimes have not been indicated (N/A) and because some boats have not fished for transparent goby.

The results of the processing related to the questionnaires are the following:

Vessel owner: in almost all cases the owner of the boat is also the captain.

The average age of the fisher: 47 years (between 26 and 66 years old).

Qualifications: Italian lower middle school (age 14).

Fisher's residence: Manfredonia.

Years as a fisherman: 29 years fishing, 25 years fishing transparent goby.

Gear: fishing is predominantly carried out with bottom trawl nets, which in some cases are accompanied by gillnets and more rarely by mid-water trawling and only in two cases by scallop dredges.

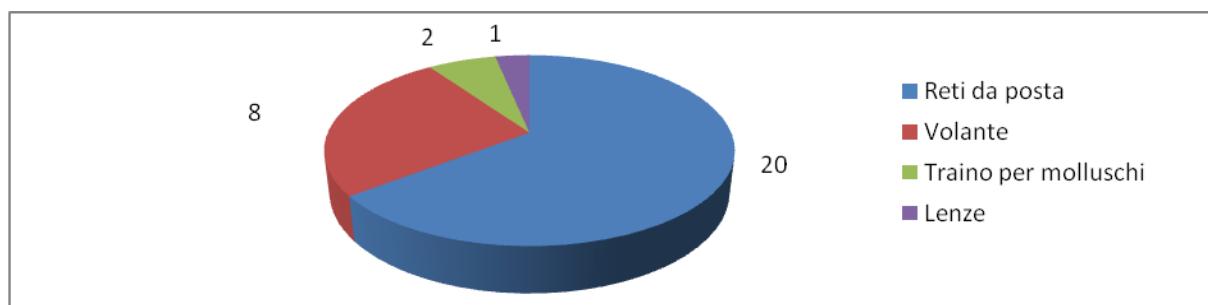


Figure 10 - Other gears used by the vessels authorised to fish transparent goby in Apulia (n.) (source: data elaboration from the socio-economic questionnaire).

- Location of moorings/Port: all boats are in the Port of Manfredonia: (West pier, East pier, North pier, the “Cala Spuntone” dock)⁴, except for one boat that is moored in the port canal at the mouth of the Capoiale river.
- Transparent goby crew and crew for other fisheries: there were no differences in the composition of the crew for transparent goby and other types of fishing practised. Including the captain, an average of 2.2 units (2 to 3 units) were employed on board.
- Average wages of the crew: 895 euro (700 to 1.240 euro).
- Children of working age: slightly over half of the respondents (51%) said they have children over the age of 16 years. Among these, 45% said that their children are engaged in fisheries and would like to continue fisheries, including even transparent goby.
- Impact of fisheries on family income: fishing is for all respondents the only source of household income.

⁴ The old port consists of two long piers (west pier 900 m and east pier 925 m) and the North shore. At the end of the West pier there is a dock called “Cala Spuntone”.

- Catches: from an average of 66 replies, 1.142 kg (from 29 to 6409 kg), of which: 54% transparent goby and 46% other species.
- Turnover: € 12.282 from an average of 66 replies (from 391 to 39.647 euro), of which: transparent goby sales were 63% and 37% other species.
- Intermediate consumption: from an average of 65 replies, 5.708 euro (100 to 15 453 euro), of which: 32% intermediate consumption of transparent goby and 68% other species.
- Labour costs: from an average of 65 replies: 6.410 euro (from 1022 to 19.884 Euro).
- Transparent goby fishing days: from an average of 82 replies: 7 days (from 0 to 17 days).
- Total fishing days: from an average of 64 responses: 28 days (0 to 46 days).
- Incidence of Transparent goby on the total fishing days: regarding the average of 64 replies, during the period examined 35 days of fishing were carried out overall, of which 20% were for transparent goby.

Given the presence of non-responses, distributed differently between the variables, a subset of questionnaires was identified with valid responses for all the variables set (n. 65), to provide comparable results.

Table 8 - Added value to transparent goby fisheries in Apulia, 2013 (in Euro).

	Per vessel	Per crew member	Per fishing day
Turnover	7 812	3 526	1 092
Intermediate consumption	1 800	812	252
Added value	6 013	2 714	840

SOURCE: ELABORATION OF THE SOCIO-ECONOMIC QUESTIONNAIRE.

Concerning the second section of the questionnaire, the key information on fishing activities carried out in the years 2009 and 2010 by the cooperatives and fishing enterprises is presented.

Table 9 - Transparent goby fisheries in Apulia, 2009 and 2010.

	Cooperative company	vessel	turnover	T. goby turnover	Intermediate consumption	Intermediate consumption T. goby	T. goby crew	T. goby fishing days
		n.	euro	%	euro	%	n.	n.
2009	6	64	3 886 607	7.3	1 742 685	9.6	172	280
2010	5	63	3 755 411	9.6	1 930 852	11.0	143	264

SOURCE: ELABORATION OF THE SOCIO-ECONOMIC QUESTIONNAIRE.

Table 10 - Added value to transparent goby fisheries in Apulia, 2013 (in Euro).

	Per vessel	Per crew member	Per fishing day
2009			
Turnover	4 453	1 657	1 018
Intermediate consumption	2 614	973	597
Added value	1 839	684	420
2010			
Turnover	5 723	2 521	1 366
Intermediate consumption	3 371	1 485	805
Added value	2 351	1 036	561

SOURCE: ELABORATION OF THE SOCIO-ECONOMIC QUESTIONNAIRE.

By way of comparison, the same information, derived from socio-economic monitoring performed in Tuscany in 2011 relative to no. 8 completed questionnaires, is summarized below. In this case, the turnover is € 6.800 per vessel, with a margin of intermediate costs at 12%, while for each employee, turnover amounted to 4.200 Euro and the added value of 3.700 euro.

Table 11 - Added value to transparent goby fisheries in Tuscany, 2012.

	Per vessel	Per crew member	Per fishing day
Turnover	6 811	4 192	224
Intermediate consumption	839	517	28
Added value	5 972	3 675	197

SOURCE: ELABORATION OF THE SOCIO-ECONOMIC MONITORING QUESTIONNAIRE IN TUSCANY.

In conclusion, the survey showed that the fishing vessels authorized to fish transparent goby account for 20% of the fleet and 25% of the tonnage of the Manfredonia Maritime District. These boats have tonnage, engine power and hull length above the average of the district but their average age is lower.

Transparent goby fisheries have mainly been carried out by fishers belonging to cooperatives, which have generally used trawl nets as well as other gear (especially gillnets and mid water trawl nets). Fishermen have an average age of 47 and have been in the business for 29 years, slightly less (25 years) for transparent goby fisheries. Their household income depends almost entirely on fishing; in terms of its impact on income from fisheries, the specific activity of transparent goby fisheries is highly variable, ranging between 4% and 80%. The involvement of other family members is not entirely negligible in the fishery in general.

The total number of fishing days amounted on average to 32, but with considerable variability. Based on the information collected with the questionnaire, catches of this species are extremely variable from one vessel to another: with an average of 167 kg, the range is from 1.7 kg to 600 kg. The selling price of the transparent goby is difficult to establish because it depends mainly on the Genoa market and is based on the amount caught, and is conditioned by the period (prices in the week before Christmas are without a doubt higher than in January). The indicative price ranges from 25 to 55 € / kg. Concerning the subgroup of questionnaires with valid responses for all variables, we find that the turnover is € 7800 for boats, with an incidence of intermediate costs of 23%. The turnover per employee amounts to 3.500 euro, and the added value is 2.700 euro.

As far as the socio-economic analysis for the year 2014 is concerned, the same format of the questionnaire used in 2013 has been adopted referring to its first section, aiming at investigating the information of the period March-April 2013 (Annex 1). Considering that the fleet involved in the experimentation carried out in 2014 is the same engaged in 2013.

By June 2014, n. 47 questionnaires had been returned filled-in by cooperatives and fishing companies for each vessel referring to the period March-April 2014.

Table 12 - Socio-economic questionnaires returned in 2014 (n.).

Cooperative/Fishing company	Section A) March-April 2014
Guerra Snc	2
I Pescatori di Manfredonia	3
La Bussola	0
Michelangelo	1
Oceania	14
Papa Giovanni XXIII	13
San Pio	13
Stella Maris	0
Universo	0
Olivieri Snc	1
Total	47

The main results of the analysis concerning the filled-in questionnaires are reported below. Similarly, in 2013 it is observed that not all the information required are always available, both because sometimes it is not reported (ND) and because some of the vessels did not carry out the transparent goby fishing.

The results of the analysis on the questionnaires, basically similar to 2013 ones, are the following:

- Fishermen owners of the vessel: in almost all cases, the owner is the captain as well.
- Fishermen's average age: 46 years (between 27 and 66).
- Educational qualification: lower secondary school.

- Permanent address: Manfredonia.
- Fisherman's years of activity: fisherman for 30 years, fishing transparent goby for 28 years.
- Gears: the prevailing fishery is trawling, which is sometimes coupled with gillnets, more rarely with mid-water trawlers and with just one scallop dredge.
- Transparent Goby and other fisheries crew: except from one case, there are no differences in the composition of the crews targeting transparent goby and the ones engaged in another kind of fisheries. On average, there are 2,3 units on board (between 2 and 4 units) including the captain.
- Average gross monthly salary of the crew: 1.149,94 € (between 700 and 3.200 €).
- Son's activity in working-age: 62% of the sample declared to have children older than 16 years, among which the 30% working as a fisherman and willing to go on fishing the transparent goby.
- Effect of fishing on the family income: fishing represents for the entire sample the only source of income.
- Catch of the fishing season: average of 39 answers, 1.189 kg (between 62 and 7.414 kg), of which: Transparent Goby catch 18% and other species 82%.
- Fishing season turnover: average of 39 answers, 7.601 € (between 600 and 22.953 €) out of which: transparent goby turnover 44%, other species 56%.
- Intermediate consumption: average of 46 answers, 3.734 € (between 1.700 and 8.400 €) out of which: transparent goby intermediate consumption 19%, other species 81%.
- Labour cost: average of 44 answers, 3.918 € (between 1.400 and 8.062 €).
- Transparent goby fishing days: average of 45 answers, 4 days (between 0 and 42 days).
- Other species fishing days: average of 45 answers, 22 days (between 0 and 42 days).

- Effect of transparent goby fishing days on the total: referring to the average of 45 answers, in the period under evaluation 26 fishing days have been carried out, 17% of which targeting transparent goby.

Considering that there are several no feedbacks (ND), differently distributed among different topics, a sub-group of questionnaires showing all valid answers, have been identified (no. 46), to be in the position of providing comparable results.

Table 13 - The added value of Transparent Goby fishery in Apulia, 2014 (values in euro)

	Per vessel	Per employee	Per fishing day
Turnover	3.268	1.421	743
Intermediate consumption	697	303	158
Added value	2.571	1.118	584

SOURCE: DATA PROCESSING FROM SOCIO-ECONOMIC QUESTIONNAIRE

3.4. Updating socio-economic data

Campaigns 2018, 2019 and 2020

The socio-economic data updating for the period 2018 - 2020 consisted of the recording of the average price of € 17.00/kg and the calculation of the revenue per boat as per the following tables.

Table 14 - Revenue per vessel 2018

Year 2018	
CFR	revenue per vessel (€)
ITA000006465	25296
ITA000006474	25245
ITA000006503	3400
ITA000006529	22610
ITA000006566	13515
ITA000006684	12308
ITA000006688	8925
ITA000006705	30566
ITA000018665	34017
ITA000019425	10863
ITA000024799	21641
ITA000026070	15096
ITA000016902	6630
ITA000006506	8670
ITA000006692	38590
ITA000006533	1020
ITA000006653	7021
ITA000006659	816
ITA000018117	17425
ITA000019001	3740
ITA000018385	47617
ITA000006642	13804
ITA000027914	6290

Table 15 - Revenue per vessel 2019

Year 2019	
CFR	revenue per vessel (€)
ITA000006465	1241
ITA000006474	33796
ITA000006503	12682
ITA000006529	2975
ITA000006566	9537
ITA000006622	9452
ITA000006627	3060
ITA000006637	2941
ITA000006649	18428
ITA000006657	8024
ITA000006684	4964
ITA000006688	1105
ITA000006696	4471
ITA000006698	3553
ITA000006705	4845
ITA000018665	13362
ITA000019042	2465
ITA000019055	408
ITA000019425	7191
ITA000024693	1190
ITA000024799	4284
ITA000025313	2720
ITA000025471	8347
ITA000026070	14654
ITA000016902	2295
ITA000007100	5848
ITA000006506	7140
ITA000006562	680
ITA000006628	4216
ITA000006658	6341
ITA000006690	7820
ITA000006692	4250
ITA000006700	6970
ITA000006896	7650

Table 156 - Revenue per vessel 2020

Year 2020	
CFR	revenue per vessel (€)
ITA000006622	7990
ITA000006658	8279
ITA000006690	3060
ITA000006472	2499
ITA000019001	1615
ITA000002471	2023
ITA000006896	2380
ITA000019425	19397
ITA000006566	2499
ITA000006503	952
ITA000019055	15436
ITA000002898	13455,5
ITA000006700	7378
ITA000006620	5482,5
ITA000027914	7752
ITA000006529	7097,5
ITA000006684	5933
ITA000006464	10820,5
ITA0000066401	3357,5
ITA000018665	16991,5
ITA000006474	16192,5
ITA000024693	29996,5
ITA000006526	6477
ITA000006628	11849
ITA000026070	23451,5
ITA000006649	8729,5
ITA000006692	28891,5
ITA000006462	3000,5
ITA000019042	9826
ITA000006465	4607
ITA000006671	10072,5
ITA000006657	30455,5
ITA000018551	4267
ITA000006542	3604
ITA000025313	3748,5
ITA000006696	13642,5
ITA000023241	8389,5

Campaigns 2022, 2022-2023 and 2023-2024

On the social aspects, it must be considered that the number employees directly involved into the fishing operations (from November to May, indeed) is around 160 persons, while the indirect activities involve about other 180 people, cooperatives workers, transportation and sales staffs etc.

The dedicated fishermen, base their income on its constant and cyclical presence in the gulf, thanks to the know-how given by the long experience handed down.

The technical possibility that this type of fishing can be carried out in the future is ensured by the studies on the biology of the species outlined in the foreword.

The 2024-2027 Management Plan will, however, implement all survey strategies to improve and enrich the relevant data.

The present proposal of management plan, is inspired by the Green Paper on the reform to the Common Fisheries Policy, proposed by the European Commission, where, in the section 5.1 states:“.....Fisheries with their large share of small- and medium-sized companies play an important role in the social fabric and the cultural identity of many of Europe’s coastal regions. Many coastal communities remain dependent on fisheries for their income, some of them with limited potential for economic diversification. It is therefore essential to secure a future for coastal, small-scale, and recreational fishermen taking fully into account the particular situation of the small- and medium-sized enterprises.....”.

The issue of guaranteeing future employment for those who practice artisanal fishing in the Mediterranean is therefore highly topical in an area grappling with a difficult economic situation, such as that of the Manfredonia Maritime District.

In this economically depressed area of the Apulia region, the catching and marketing of *Aphia minuta* in fact means income generation in social contexts made up of single-income families, where this fishery can provide a real livelihood. The continuation of this activity therefore supports a local-scale economy, while its cessation would have

significant negative social repercussions in terms of employment and income for the category, which would affect the entire community.

It must be considered that the product is sold also outside the region, in the whole national territory and in Spain indeed. Then, the occupational aspects are important. The more important if is considered that the transparent goby fishery is carried out during a period when the yields related to the other fisheries are in their seasonal slowdown.

In this regard, it has been reported that during the first campaign, 2022 (Fig. 11) the prices for the sale to the wholesalers have been fluctuated between a maximum of 34.10 €/Kg and a minimum of 10 €/Kg. Sometimes (example Feb.23rd – Mar.21th - Apr.11th), there is a strong inverse relationship between quantity landed and prices.

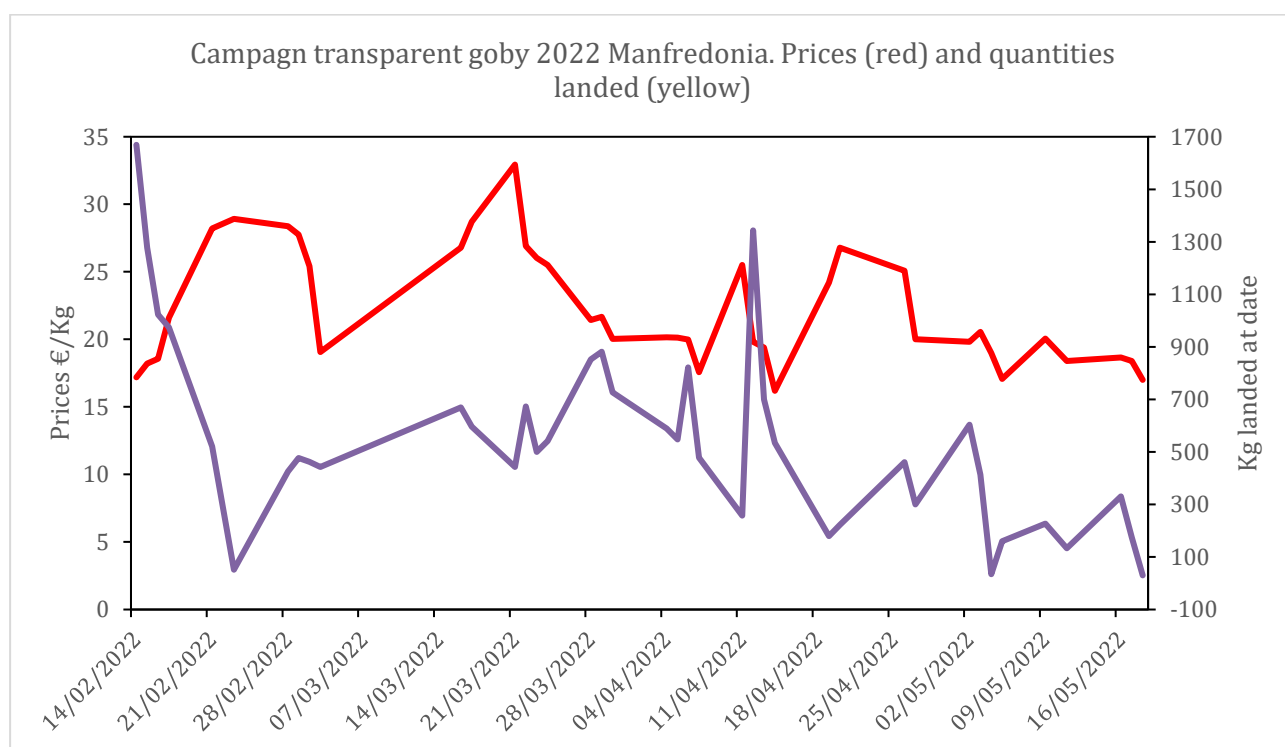


Fig. 11 Prices and quantities landed 2022

During the second campaign, 2022-2023, Fig. 12, there was a minor prices fluctuation, probably because the fishery has been carried out for the highest number of effective days against the previous (75 against 40), and a major presence of the product on the

market has been granted. The maximum price achieved was 26 €/Kg at the beginning of the campaign, the minimum of 6 €/Kg has been recorded after Christmas holidays, and in the middle February.

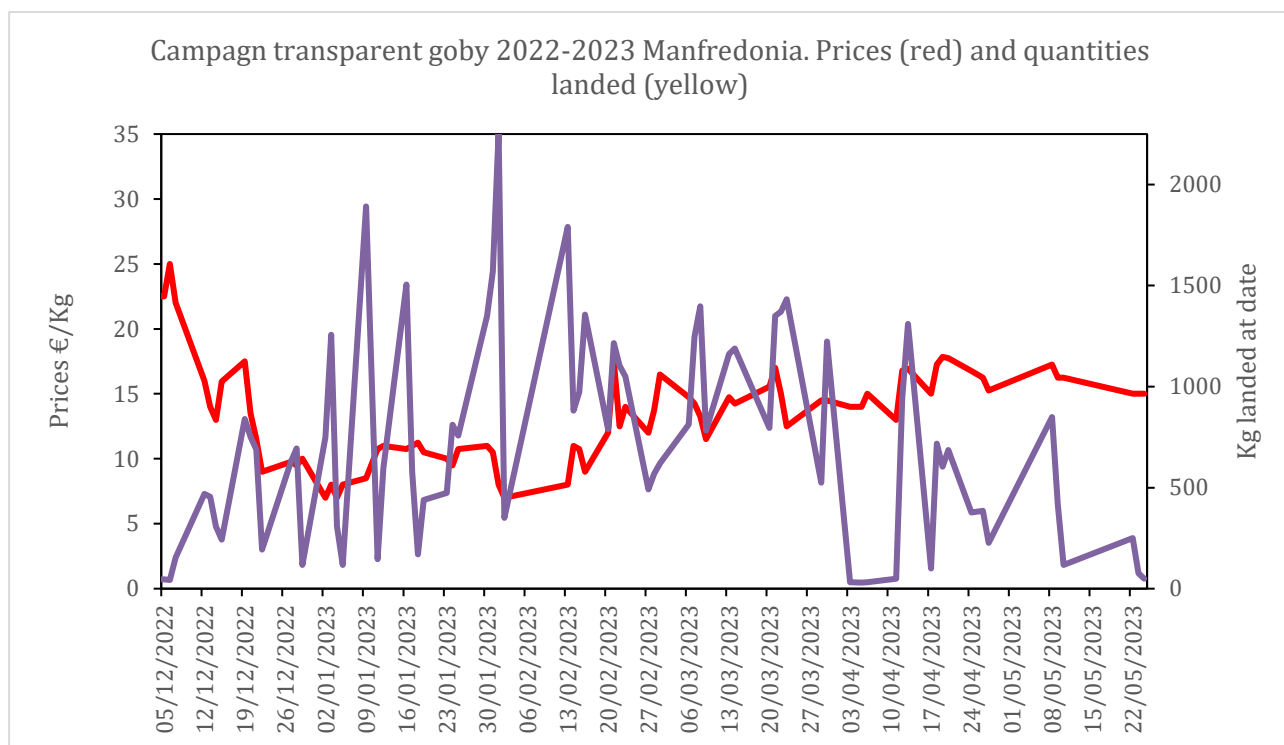


Fig. 12 Prices and quantities landed 2022-2023

During the third campaign (Fig. 13), 2023-2024, that has been going for 102 effective days, the prices fluctuations are smaller, between a maximum of 20 €/Kg at the beginning of the period and a minimum of 9 €/Kg during the firsts days of January and seems not impacted by the landed quantities.

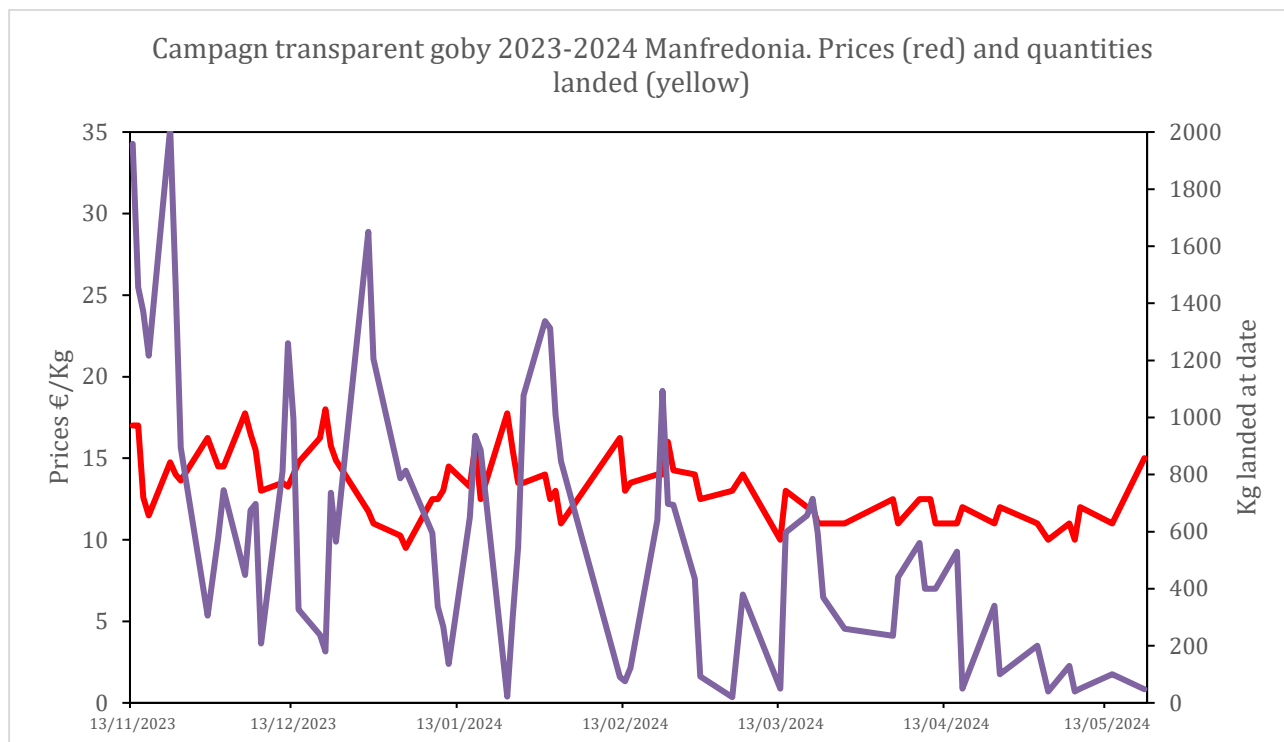


Fig. 13 Prices and quantities landed 2023-2024

3.5. Historical biomass estimation and assessment of the level of exploitation of transparent goby stocks in the Gulf of Manfredonia

At the moment, no information is available about the state of the stock of *Aphia minuta* in the Gulf of Manfredonia. There are therefore no estimates of the rate of exploitation and fishing mortality F , the relationship between biomass and recruitment, etc. The biological characteristics of the species (very short life cycle, semelparous reproduction, etc..) and the method of exploitation (the transparent goby is a species that is highly exploited in a relatively short period) should entail an obvious, measurable decrease in its biomass over time. For this reason, the Leslie-De Lury depletion model was used to obtain estimates of the biomass of the *A. minuta* stock in the Gulf of Manfredonia. The general concept at the basis of depletion models is to examine how the exploitation, (capture of specimens from the stock through fishing), affects the relative abundance (which can be expressed as catch per unit effort) of the stock itself. In the simplest, hypothetical cases, the removal of specimens leads to the relative abundance of the stock reducing to zero: the total removal, therefore, allows an estimate of the total biomass of the initial stock.

However, it is important not to think of estimating models of depletion as a deliberate attempt to overfish. Often, the depletion models are applied on historical catch data to obtain estimates of the biomass of virgin stock, that is, before the beginning of the exploitation. Knowing the virgin biomass of the stock allows for the determination of whether cases of overfishing occurred during the development of the commercial exploitation of the resource.

The Leslie-De Lury depletion model is based on the concept of closed population, assuming that there is no or negligible recruitment, migration and natural mortality (Hilborn and Walters, 1992). These assumptions, except for the natural mortality, are easy to adapt to the populations of transparent goby: the fishing season generally takes place before recruitment of the next generation to the exploited occurs; in addition, given the biological and ecological characteristics of the species (in terms of

bathymetric distribution, reproduction, ability to change areas, etc..), contacts with neighbouring populations seem to be quite limited.

Where natural mortality is concerned, it can be assumed that this is negligible, in a short period such as that of a fishing season a few months long, in comparison to fishing mortality.

In light of these assumptions, the behaviour of a population can be described by this formula:

$$B_t = B_0 - K_{t-1}$$

where B_0 is the initial biomass, B_t is the biomass at the end of the fishing period t , and K_{t-1} can be defined as cumulative catch:

$$K_{t-1} = C_1 + C_2 + \dots + C_{t-1} = \sum_{i=1}^{t-1} C_i$$

where C_i is the catch in every single i - catch event. It should also be assumed that catch at the t - event in the fishing period t is described by the following equation:

$$\frac{C_t}{f_t} = qB_t$$

Where C_t is the catch, f_t is the level of fishing effort (number of vessels, number of fishing days, etc.) in the t - fishing event, and q is the catchability coefficient, which represents the fraction of the population removed by a single unit of effort.

Substituting the first equation in the third we get:

$$\frac{C_t}{f_t} = q(B_0 - K_{t-1})$$

The last expression is in the form of a linear model, in which the relationship between C_t and f_t , defined as the catch per unit effort (CPUE), represents the dependent variable, the cumulative catch K_{t-1} is the independent variable, the line of q , and qB_0 the interception on the y axis.

Through the analysis of the linear regression of catch per unit effort (CPUE, kg/day/vessel), depending on the catch cumulative, the intercept on the x-axis representing the estimate of spawning stock biomass at the beginning of the fishing period (B_0) was determined.

The analyses were carried out using the statistical package "fish methods" (Nelson, 2012), available from R (<http://www.r-project.org>, R Core Team, 2012). The available data for the analysis came from official fisheries statistics collected by the Producers Organization and Fish Market in Manfredonia. Data on the daily catch and fishing effort expressed as the 'number of vessels'/'fishing day' were used to estimate the parameters of regression according to the Leslie-De Lury depletion model. In particular data relative to the 2005 fishing season (January to May 2005), 2006-2007 (November 2006-May 2007), 2008-2009 (December 2008-May 2009) and 2010 (January-May 2010) were used. The data from 2007-2008 were not considered in the results, since it was not possible to obtain a meaningful estimate of the regression parameters according to the Leslie-De Lury model.

Estimation results of the initial biomass (B_0) of the stock of transparent goby in the Gulf of Manfredonia obtained through the Leslie depletion model are shown in Table 17, together with the relative standard error and the confidence interval.

As can be seen in Table 17 and in Figures 14–17, which illustrate the regressions estimated by the Leslie depletion model in the four periods of Transparent goby fishing in the Gulf of Manfredonia considered for the analysis, the results show scenarios that oscillate somewhat, with estimates of the biomass of the stock of

transparent goby varying between 30 tons in 2005 and 100 tons in 2008-2009 and 2010. However, the resource biomass estimates obtained in the last two fishing seasons seem to be consistent at around 100 tons, although it must be noted that there is a high degree of uncertainty where the 2010 estimates are concerned, with a confidence interval of between 70 and 125 tons.

Table 17 - Estimation of the initial biomass of the stock of transparent goby in the Gulf of Manfredonia by the Leslie-De Lury depletion model.

Fishing season	B ₀ (tons)	Standard error	Confidence interval (95%)
2005	31.1	4.3	22.3-39.9
2006-2007	54.4	3.1	48.2-60.5
2008-2009	100.1	6.9	86.3-113.8
2010	97.7	14.6	68.4-126.9

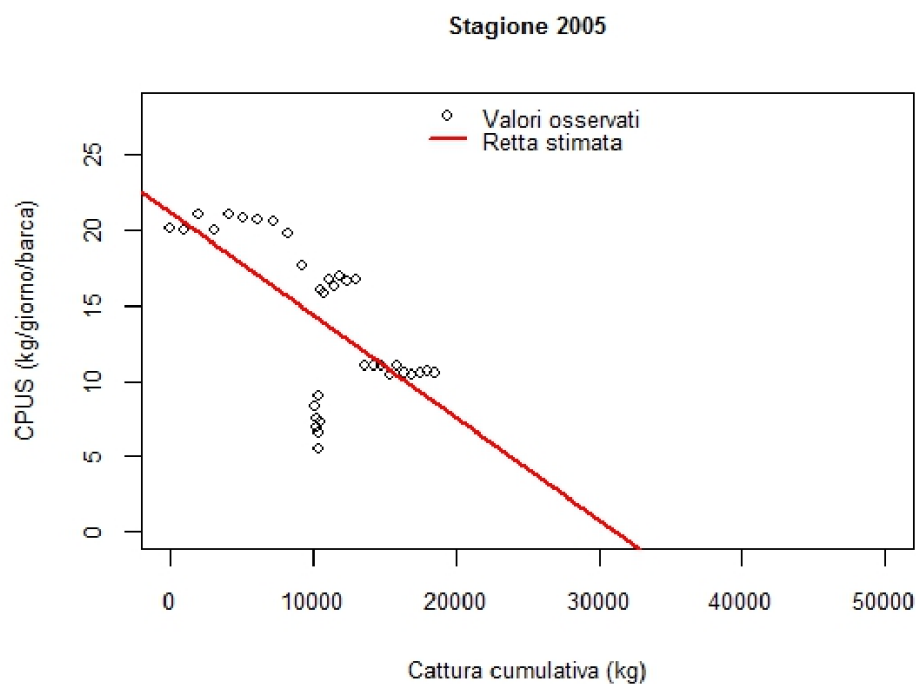


Figure 114 - Regression line estimated with the Leslie depletion model for the fisheries period January – May 2005 in the Gulf of Manfredonia.

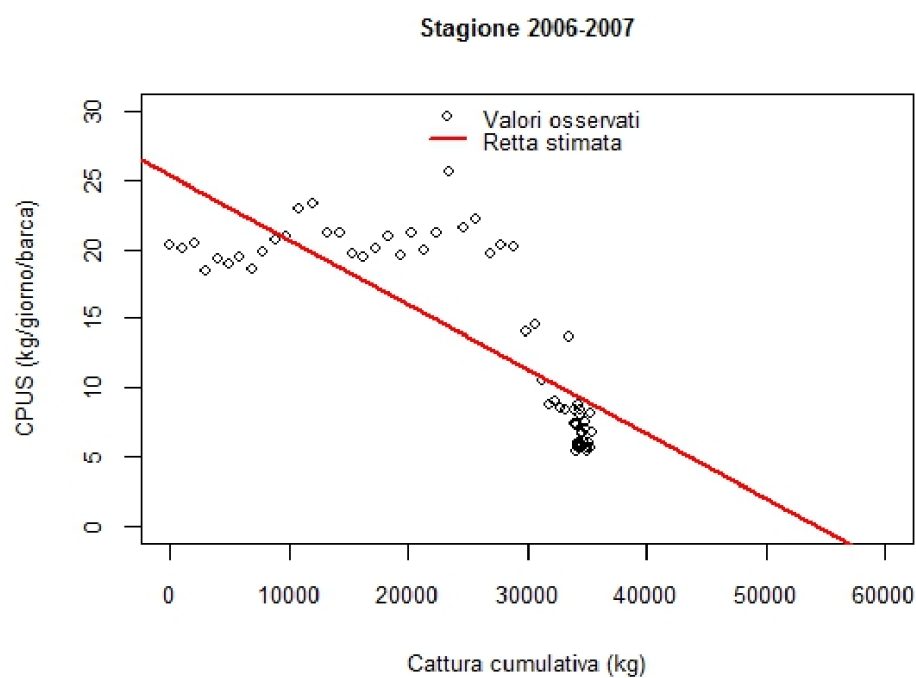


Figure 125 - Regression line estimated with the Leslie depletion model for the fisheries period November 2006 – May 2007 in the Gulf of Manfredonia.

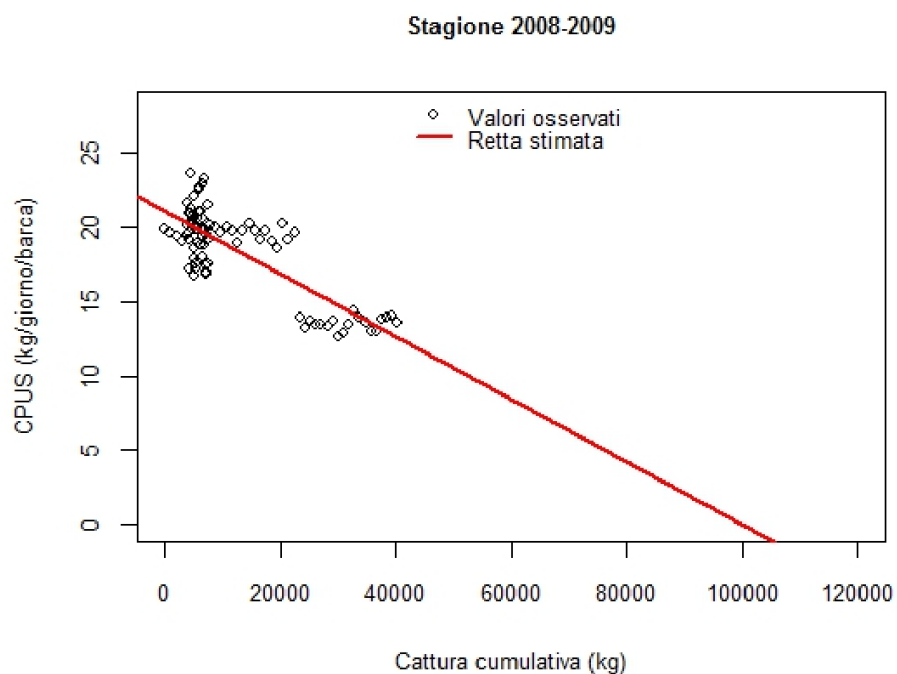


Figure 136 - Regression line estimated with the Leslie depletion model for the fisheries period December 2008– May 2009 in the Gulf of Manfredonia.

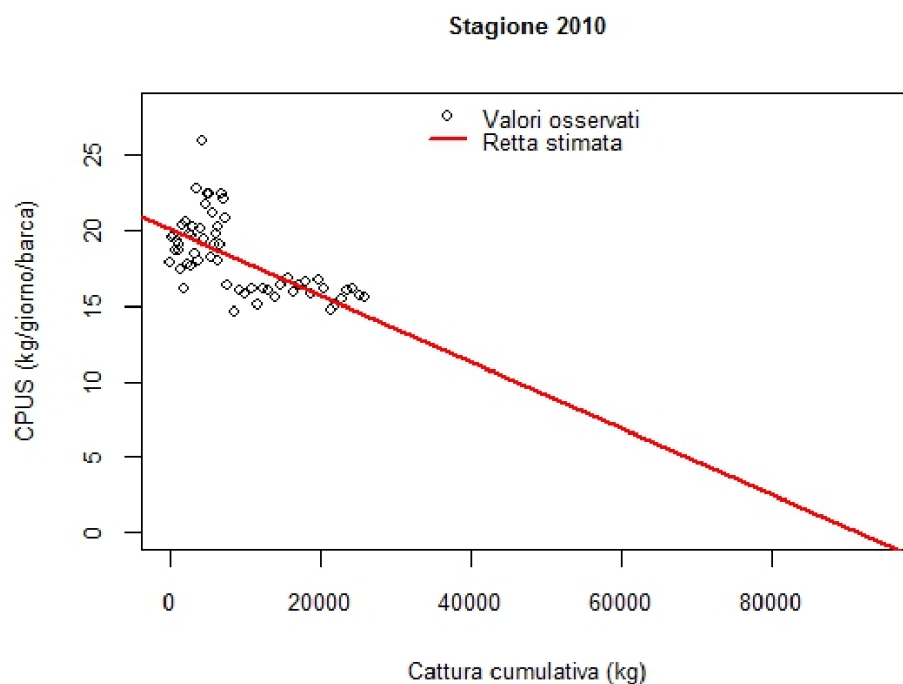


Figure 14 - Regression line estimated with the Leslie depletion model for the fisheries period January – May 2010 in the Gulf of Manfredonia.

With the information that was available at the time, the stock wasn't considered depleted or in a suffering state, due to its life cycle (duration, reproduction strategy etc...). It is important to underline that the resource aggregates inshore during a very short year period, the weather and marine conditions operate the best limitation to the fishing effort, because the fishery needs calm sea and, in particular during the winter season, there are many days in which it cannot be conducted. The fishery targets the adults (small size adults) leaving the juveniles safe. The species is a massive spawner, the gonad somatic ratio values are very high around the mid-March when they reach 29% of body weight and this value also increases in September, when there is still a considerable presence of mature females ready to spawn (around 20%); the growth is very fast. The confirmation of the good state of the stock lied in the constataction that the long-term yield doesn't show any flexion, as predictable for a short life cycle species. The variability in the CPUE values fitted with the fishery uncertainty.

3.6. Current biomass estimation and assessment of the level of exploitation of transparent goby in the Gulf of Manfredonia

Considering all the information, collected, analyzed and produced; and incorporating and expanding on the notes and suggestions from STECF reports, such as STECF PLEN-21-01, STECF PLEN-21-02 and STECF PLEN-17-01, a new strategy for evaluating and selecting the CPUE target and trigger thresholds was defined based on the current situation and the most recent continuous historical series. The submitted plan falls under the condition highlighted in report section 4.1 in STECF PLEN-21-01 report, where: 1) no reliable estimates of the current stock size (biomass, B) are available; 2) no reliable estimates of the current fishing mortality (F) levels are available; 3) inferences of initial biomass (B_0) or B_{msy} are not possible; 4) estimates of early CPUE data of the fishery, that may relate to B_0 , aren't available, since data collection for these fisheries started when the fishery was already developed. The relatively small fishery under consideration does not, currently, allow for the development of robust statistical stock assessment models, primarily because of the still short time series, which currently only has accurate and continuous data available for the last three fishing seasons from 2018 to 2020. There are also the additional parts of the historical series that are uneven in time and also include changes over time to the type of fishery, gear, metier, and fleet; which are still being reconstructed at this time. However, until a retrospective reconstruction of the time series is available and established, the case study still falls into a condition where the available information does not allow for a data-limited stock assessment.

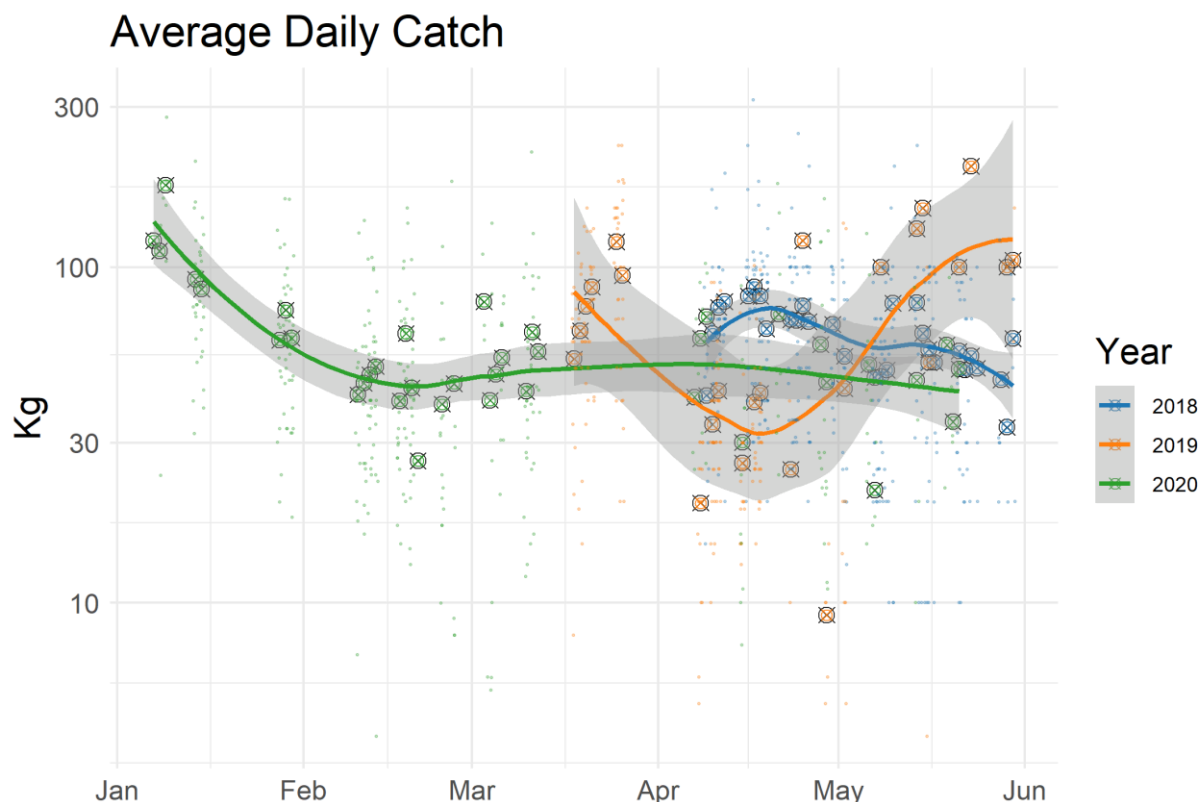


Figure 15 - Average Daily Catch for the fisheries seasons of the year from 2018 to 2020. Large crossed dots - daily average catch, small transparent points - daily catch, solid line - smoothed average loess curve; blue - 2018, orange - 2019, green - 2020. On the x-axis the time and the catch quantity in the y-axis.

Thus, agreeing with the assessments outlined in PLEN 21-01 - Section 4.1, “Discussion on the use of cpue triggers as management reference points in data-poor situations”, and in such circumstances suggest the use of alternative approaches for assessment and management rules, involving parameters such as the historical average of catch rates (CPUEs), as a proxy for abundance, if the average (or median) value of a historical CPUE time series can be a reasonable target for a high long-term yield (Fmsy proxy) and in cases that there have been no signs of impaired recruitment at the lowest observed historical CPUEs. The update presented is therefore focused on proposing a strategy for the precautionary management of this resource, in the meanwhile that the continuity of data collection as in the past three years is guaranteed at least for the formulation of surplus production models with more years available; and that further knowledge about the exploited resource is acquired,

allowing the structuring of more statistically rigorous models for estimating the size and structure of the stock, such as size and age distribution; spatial distribution of the population; identification of nursery and spawning areas; identification of migration zones and behaviours; stock recruits relationship, etc. Thus, the analysis presented includes three consecutive fishing seasons over the years 2018, 2019, and 2020. The graph of the average daily catch landed amount, shows the observations of the three years superimposed considering only the day and month of fishing. The maximum observed range is from January to May, with 2020 spread over almost the entire period except for the latter part of May; in 2019 the season lasted from mid-March to May, and 2018, the shortest year, from the first half of April to May.

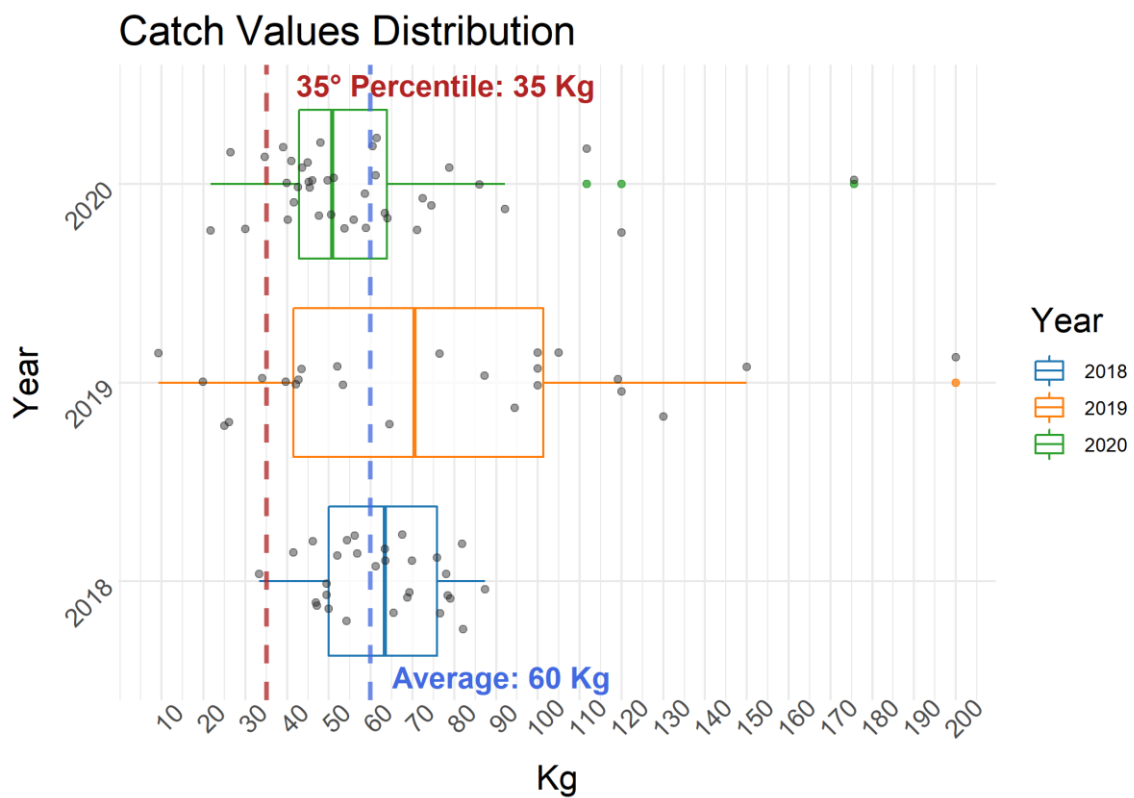


Figure 16 - Catch Values Distributions for the fisheries seasons of the year from 2018 to 2020. Large horizontal boxplot of the values distributions, small dots - daily catch averages; blue box - 2018, orange box- 2019, green box- 2020; vertical dotted lines - catch thresholds; red - 35th percentile, blue - average. On the x-axis the catch quantity and the year as y-axis.

The distributions of observed catch values, for 2018 are more concentrated on a median of just over 60 kg and with a range between 30 and 90 kg; 2019, shows the maximum range observed from 10 to 200 kg, with a median, slightly higher, of about 70 kg; 2020 has an intermediate-range between 20 and 170 kg and a median of about 50 kg. Given also the information presented below, and interpreting these average observed values as reasonably stable and considering the average values of quantities fished observed as an indicator of long-term maintenance targets for the resource, we can identify as Ctarget an average daily catch of almost 60 Kg. It follows then from the identified target value, the definition of a precautionary buffer as a limit reference point to be monitored and not exceeded, and whenever are the CPUEs recorded fall below the reference point, the fishing effort should be reduced to aid recovery to levels above the trigger point. As noted in STECF PLEN 21-01: “In the case of boat seines fisheries, neither values of the pristine stock size nor catch rates under a non-exploitation status are available. The limit thresholds are based on catch rates of stocks already exploited. Therefore, STECF warns that a LRP for annual catches based on the 25th percentile cannot be considered precautionary. Literature suggests that when a reliable estimate of pristine stock size is available, a stock size of approximately 35-40 % of the pristine level can be considered as a reasonable proxy of the stock size at MSY (Caddy and Mahon, 1995).

Table 18 - Average, Median, 25 Percentile and 35° Percentile of the recorded catch of transparent goby in the Gulf of Manfredonia in the fishing seasons between 2018 and 2020

	Year	Average	Median	25° Percentile	35° Percentile
Catch	2018	64.71	60	31	40
	2019	57.54	40	25	30
	2020	56.87	46.25	30	36
	Total	59.85	50	30	35

Setting the LRP around that value (35 or 40th quantile of the historical time series) would thus be considered more precautionary, and more in line with the CFP objective and with the management of the data-rich stock, allowing the fishing pressure to be

reduced before the target stock is heavily depleted. Ideally, those LRPs or CPUEs thresholds would ultimately deserve some more rigorous definition either theoretical or via MSE testing to show their validity within the frame of the management plans to achieve sustainability.” A more precautionary LRP, more in line with the CFP objective, and able to respond to excessive fishing pressure when signals of heavy depletion of the stock, is then computed on the 35° quantile of the observed time series and it results in a value of 35 Kg.

This is followed by the description of the parameters recorded and the evaluation of the subsistence of the prerequisites indicated by the STECF for the management of the stock in a situation of limited data availability or potentially collectable. The historical series of observed fishing efforts was displayed in the same manner as that for landed quantities, i.e., the three overlapping seasons, with observations being discriminated for the day-month combination. The observations show values always lower than 22 boats per day, with a variable trend that is generally medium-high at the beginning of the season, crosses intermediate values in the middle and then decreases towards the end of the season. The annual daily average for the entire time series is approximately 10 boats with a recorded maximum of 22 in 2019.

Table 169 - Average and maximum levels of effort recorded in the purse seine fishery of transparent goby in the Gulf of Manfredonia in the fishing seasons between 2018 and 2020

	Year	Average	Maximum
<i>Effort</i>	2018	11.76	19
	2019	9.75	22
	2020	9.84	21

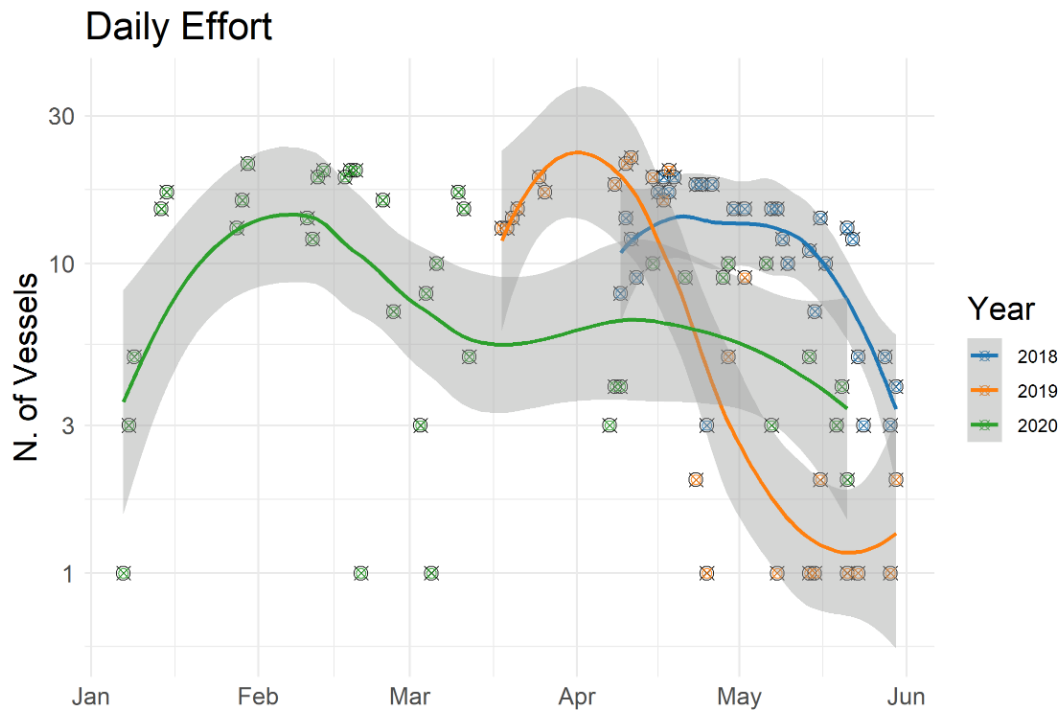


Figure 179 - Average Daily Effort for the fisheries seasons of the year from 2018 to 2020. Large crossed dots - daily number of fishing vessels, solid line - smoothed average loess curve; blue - 2018, orange - 2019, green - 2020. On the x-axis the time and the effort as number of vessels in the y-axis.

The combined analysis of these two variables, catch (Kg) on the y-axis and effort (Number of boats per day) on the x-axis, is illustrated with a scatterplot, to investigate whether there exists any relationship between the two quantities. And, except for 2019, the remaining two years show observations with a distribution, at the moment, approximating a linear type trend.

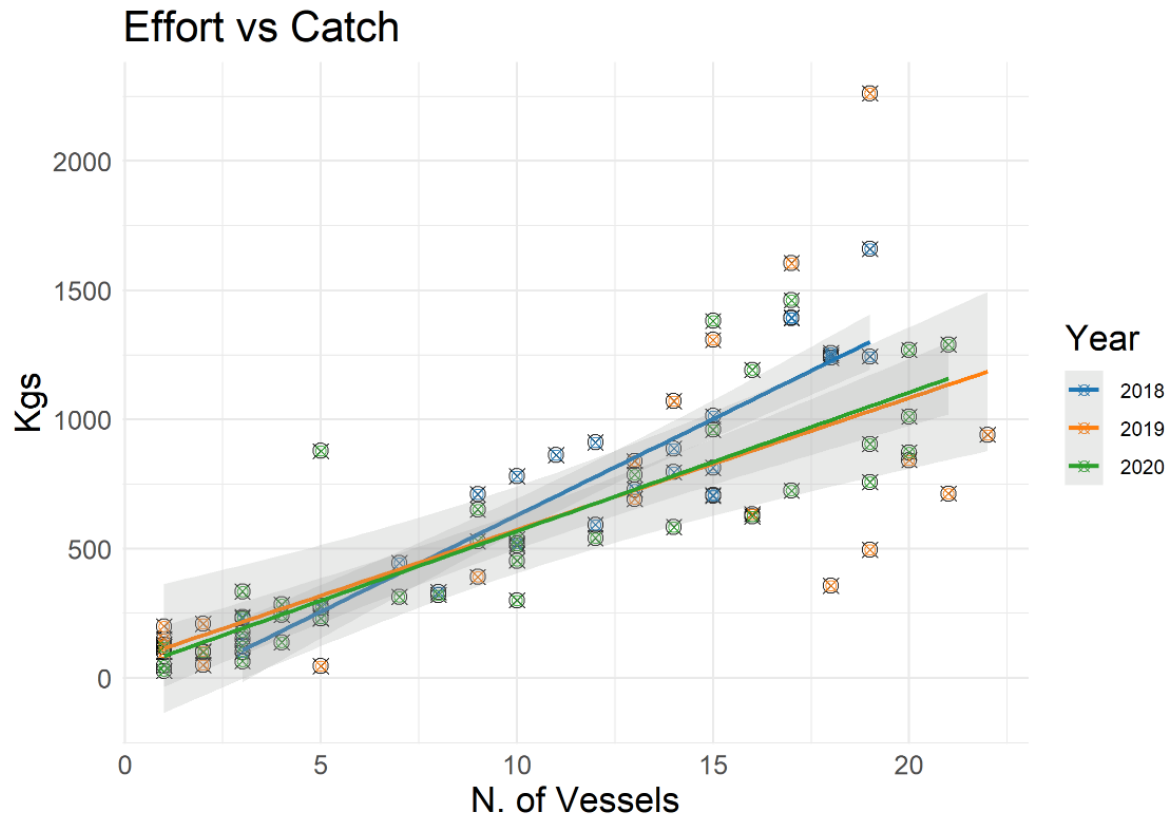


Figure 20 – Scatterplot of the Effort vs the Catch for the fisheries seasons of the year from 2018 to 2020. Large crossed dots - daily Effort vs average Catch value, solid line – regression line; blue - 2018, orange - 2019, green - 2020. On the x-axis the Effort as the number of vessels and on the y-axis the average daily catch.

The linear models constructed for the estimation of catches as a function of effort level show a high level of linear correlation for the years 2018 (with an R^2 of 0.85) and 2019 (R^2 of 0.73), and instead of a much less marked effect for the 2020 season (R^2 of 0.51). This result, in addition to informing us of the presence of a linear trend in the catch/effort ratio, mainly highlights the absence of a bell-shaped trend typically observed for long-term sustainable exploitation such as the static population model with production estimation of Gordon and Schaefer. This evidence leads to the hypothesis that at present the fishery under consideration does not show a decline in the catch at the highest recorded levels of effort, thus indicating the absence of symptoms of overfishing through excessive effort. It is therefore assumed that the current state of purse seine fishing in Manfredonia is in the ascending branch of the

parabola drawn by the curve determined by the Schaefer surplus model and that the hypothetical level of Cmsy has not yet been reached and exceeded.

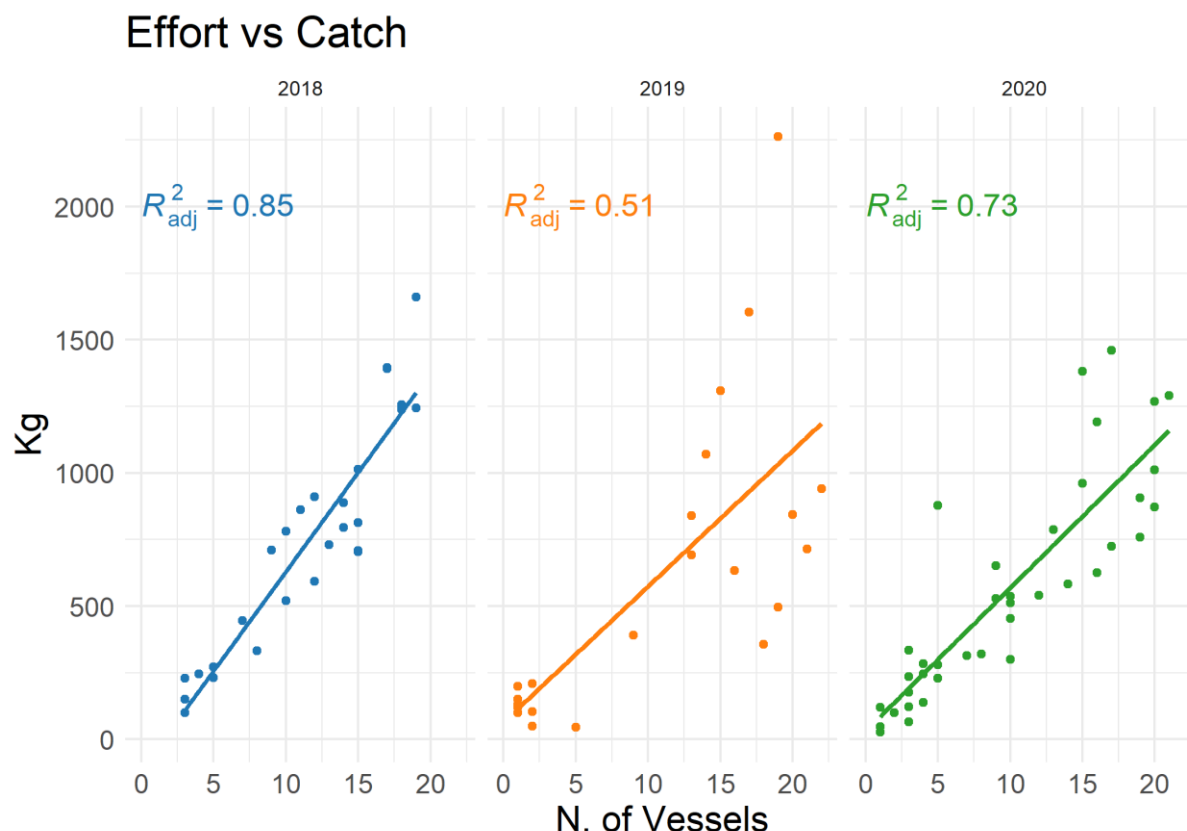


Figure 218 - Scatterplot of the Effort vs the Catch for the fisheries seasons of the year from 2018 to 2020 divided in three different panels. Dots - daily Effort vs average Catch value, solid line - regression line; blue - 2018, orange - 2019, green - 2020. On the x-axis the Effort as the number of vessels and on the y-axis the average daily catch.

The final graphs show that the conditions to employ the daily cpue time-series, or the effort vs cpue scatterplot, for describing this information with statistical clarity and reliability are not yet in place. The graph of daily cpue values per season shows that the average values are higher at the beginning and the end of the season. The graph of the distribution of the values of cpue recorded as a function of fishing effort, although a relationship of 'exponential' decrease of cpue as a function of effort could later emerge (especially for the 2019 season), seems more evenly distributed around 50 kg per boat per day.

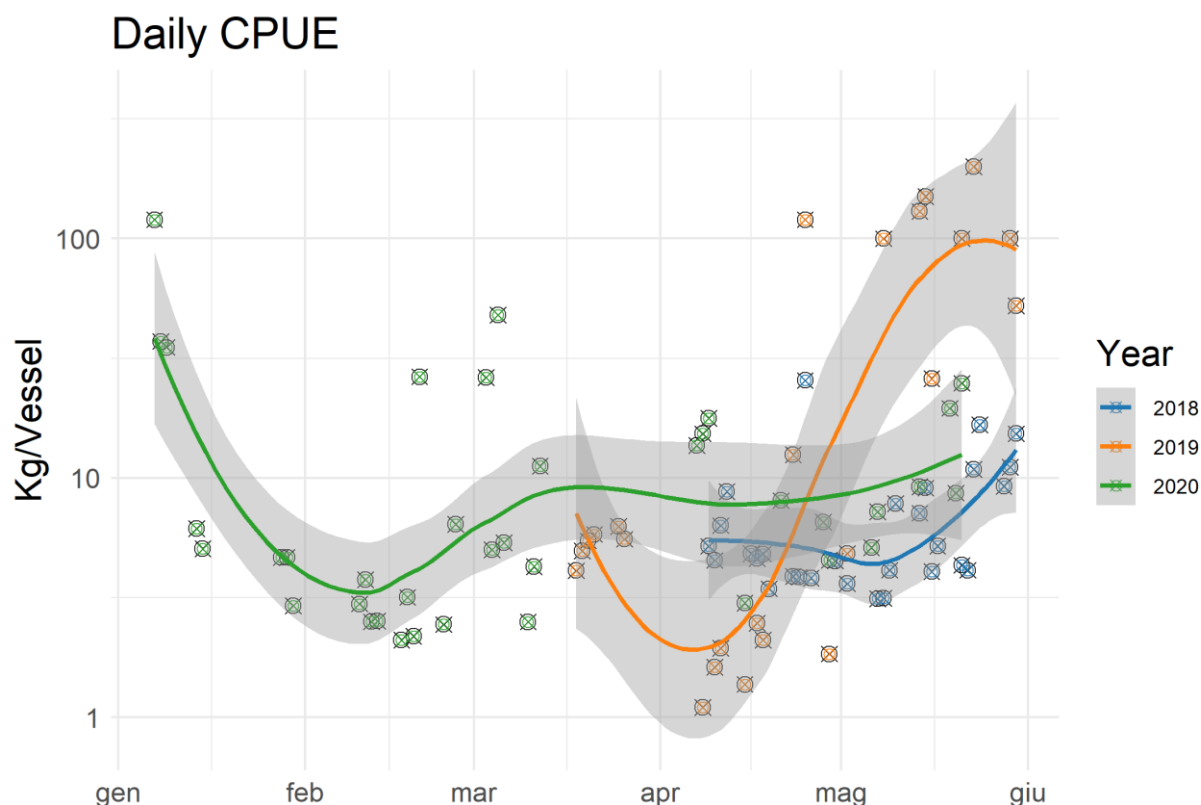


Figure 192 - Daily CPUE as Kg/vessel for the fisheries seasons of the year from 2018 to 2020. Large crossed dots - daily CPUE, solid line - smoothed average loess curve; blue - 2018, orange - 2019, green - 2020. On the x-axis the time and the CPUE as average kg per vessel in the y-axis.

As there are no reference points currently available for the species *Aphia minuta*, defined by the rate of exploitation and fishing mortality F , and as there is no knowledge about the relationship between spawning stock biomass and recruitment, any management measures may be based only on assessments of temporal biomass and catches. The analysis of the statistical distribution of monthly average yields from fisheries expressed as catch per unit effort (CPUE, $\text{kg} \cdot \text{day} \cdot \text{vessel}$), has permitted the estimation of a level of performance that can be the basis for a Management Plan for this resource in the Gulf of Manfredonia.

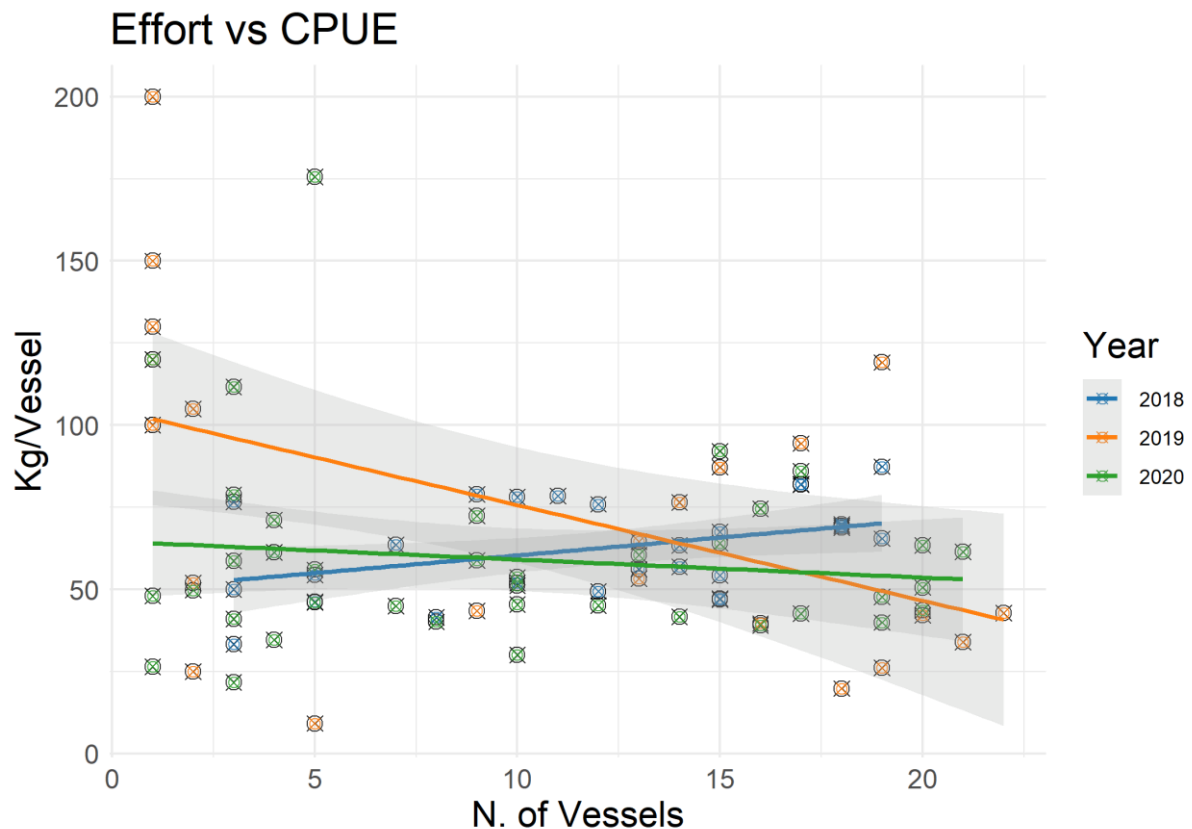


Figure 203 – Scatterplot of Daily CPUE as Kg/vessel vs Effort for the fisheries seasons of the year from 2018 to 2020. Large crossed dots - daily CPUE vs Effort, solid line regression line; blue - 2018, orange - 2019, green - 2020. On the x-axis the effort as number of vessels and the CPUE as average kg per vessel in the y-axis.

In conclusion, the fisheries can be managed in the following way:

- The number of vessels authorized to fish transparent goby in the Gulf of Manfredonia may not exceed 30 units every day, in a pool of 55;
- The duration of the fishing season must be between 1st November and 31st May;
- The weekly fishing days will be 4 (four) from Monday to Thursday;
- Fishing days for transparent goby, vessels and catches should be monitored in detail for the entire period of the fishing season (see below there is an example of a monitoring form);

- Although studies in other areas have demonstrated negligible by-catch from seiners targeting transparent goby, the impact of these fisheries should be monitored with periodic observations aboard commercial boats;
- Although it has been demonstrated in other areas that the mechanical effect of the seiners on the seabed is practically zero, assurance must be sought that the tool does not drag on the seabed and is recovered using the traditional technique;
- In line with the precautionary approach, the LRP should be increased to 35 kg/day/vessel.

Transparent Goby fisheries (<i>Aphia minuta</i>)
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Compliance with the Italian Ministerial Decree of 20.12.85 and D.M. of 11/27/90
(and subsequent integrations)

Manfredonia Maritime District

Vessel owner _____

Vessel name M/P _____ Registration N°. _____

HP _____ KW _____ TSL _____ net used m _____

Year _____ Month _____

Fishing day	Fishing area	Kg transparent goby fished	Other species	Kg other species fished

Example monitoring form for daily transparent goby catches.

4. DESCRIPTION AND USE OF BOAT SEINES

4.1. Legal, historical, biological and socio-economic framework

The rules provided with the Reg. CE 1967/2006 have made it no longer possible to practise the transparent goby fishery in Manfredonia Gulf **with the traditional modalities**. The last trawl fishery season ended in spring 2010, after which this activity was discontinued. This had a major socio-economic impact because a large fraction of the fleet lost an important source of income. For the years 2011 and 2012, financial aid measures were activated together with social safety nets to try to cope, at least in part, with the reduction in income (subsidies and social shock absorbers in the case of lay off, etc. as per Ministerial Decree no. 44768 of 23rd December 2008 and successive decrees).

In 2012, driven by the local fishery associations, a process was initiated with the scope of identifying **alternative fishing methods** to take the place of bottom trawling for fisheries targeting Transparent goby, in compliance with the law. In this framework, advantage has been taken of the experience acquired in other Italian fishing districts, in particular in the FAO-GFCM Geographical Sub Area 9 (GSA9, Ligurian Sea and Northern Tyrrhenian Sea), where a specific Management Plan has been approved and implemented since 2011 for Transparent goby fisheries with seine nets (OJ no. 192 of 19th August 2011).

In 2012 - 2013 a pilot project was implemented "Self-management plan for transparent goby (*Aphia minuta*) fisheries in the Gulf of Manfredonia" (Project no. 38/OPI/010 - Measure 3.5 "Pilot" - EFF 2007-2013), as a result, it was possible to conduct training activities for the Manfredonia fleet on the use of seine nets deployed from fishing vessels targeting transparent goby. In the context of the same project, with specific authorization from the Italian ministry MIPAAF (Note no. 1588 of 28th January 2013), it was possible to trade the transparent goby caught through the New Fish Market Manfredonia which collected the socio-economic data useful for the preparation of the Plan.

It should be noted that in 2013, thanks to revenue from the sale of transparent goby caught in the framework of the experimental pilot project described above, it was not necessary to activate the subsidies and social shock absorbers, as was the case in 2011 and 2012, this saved about 700.000 euro which State funds would otherwise have had to cover.

Seine nets are traditionally gear used in many Italian fisheries (particularly in Liguria and Tuscany, but in the past also in the Southern Adriatic) to fish small species, including transparent goby. It is a highly specialized fishing method, which requires specifically constructed fishing gear, in addition to particular technical requirements of the vessel as well as an accurate and specific fishing technique. If practised for some time, yields from transparent goby fisheries with seine nets are noteworthy and allow for significant economic returns.

Extensive studies have shown that transparent goby fisheries with this gear are highly selective (by-catch is virtually absent), thus highlighting a low environmental impact. After having demonstrated these characteristics in GSA 9 for seine nets deployed from vessels targeting transparent goby, with the support of consistent scientific data obtained after many years of monitoring, it was possible to achieve derogations to current regulations and to implement a specific Management Plan. The Management Plan in GSA 9 has established, *inter alia*, specific limits for fishing effort (number of boats, fishing period), it has set a reference point on catches and includes a specific monitoring plan.

In general, the seine net fisheries have several advantages compared to bottom trawlers. Firstly, the selectivity of the catch should be considered, which is significantly higher in seine net fisheries; this factor also minimizes the environmental impact. It should also be noted that fisheries using seine nets have no or minimal impact on the seabed, which further reduces the environmental impact.

The commercial value of the product caught is greater in the case of seine nets, as the state of specimens captured is much better than those caught with bottom trawls. Finally, the seine net fisheries require less fuel than the bottom trawl fisheries.

4.2. Description of boats seines and how they are used

The seine net used in transparent goby fisheries consists essentially of two wings with an overall length between 60 and 110 m, occasionally up to 150 m for larger vessels. The average length is 80-90 m.

The net (from 60 m) is structured as follows: two wings made up of 4 panels that decrease in size from the spreader:

- 1) The first is 8 m long with a stretched mesh size of 40 cm;
- 2) The second is 8m long with a stretched mesh size of 20 cm;
- 3) The third is 8 m long with a stretched mesh size of 10 cm;
- 4) The fourth is 6 m long with a stretched mesh size of 5 cm.

After this part, there is the body of the net (6 m long, including the cod-end). The lower part of the body has 1.200 meshes (width), measuring a stretched size of 7 mm, and there is a small band with a larger mesh. The upper part of the body is made of 1000 meshes (width) and the stretched mesh size is 10 mm. There is also a band with a larger mesh. The cod-end is locally known as the "*tulle*" is 1.5 m high and 4.5 m wide with a 3 mm mesh size.

The float line (head-rope) has floats positioned every 6 meters; the floats are similar to those used on gillnets, while the footrope carries sinkers weighing 50-100 g, placed 30 cm apart.

Figure 24 and Figure 25 show (as an example) the technical characteristics of the seine nets traditionally used in transparent goby fisheries along the Northern coast of Tuscany, which is substantially equal to the one used in Manfredonia.

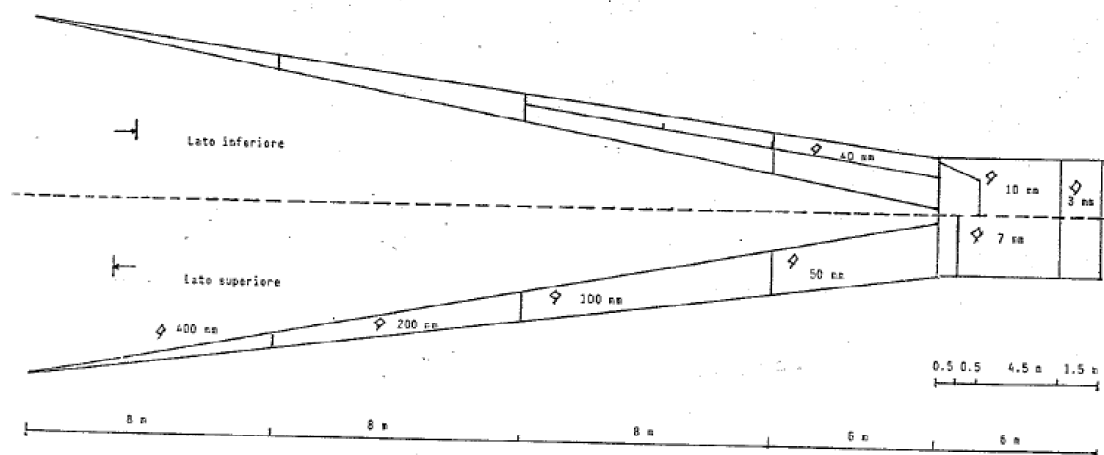


Figure 214 - Diagram of the seine net used for transparent goby fishery.

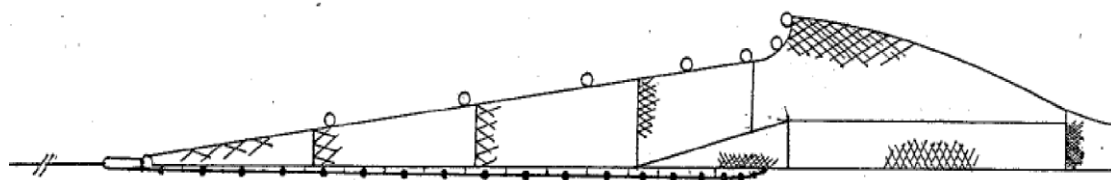


Figure 225 - Lateral view of the seine net used for transparent goby.

Operations and fishing techniques are shown in Fig 26:

Phase 1: The fish is identified on the seafloor using an echo sounder and its position in the water is marked by a small buoy (locally known as a "*pedagno*"). To evaluate the actual nature and size of the shoal, the boat circles around it several times; this also allows it to quantify the force of the sea currents and their dominant direction.

Phase 2: The net is dropped with the prow of the boat against the current. On the external side of the fish shoal, the seine rope is dropped into the sea; it is approximately 50 m long with a float at one end while the other end is attached to the wing of the net.

Phase 3: When the entire wing is underwater, the boat is positioned along the side and windward for the buoy. Then the mouth of the net is dropped into the current a

few meters from the shoal. A poor assessment of this distance may result in a less than optimal positioning of the net to the school, thus causing the catch operation to fail.

Phase 4: once the body of the net is in the sea, the other wing is lowered, followed by the second seine rope which circles the floater until reaching it. The ends of two seine ropes are then brought back on board and left, so the net can drop until it almost brushes (**in the sense of lightly touching**) against the seafloor.

Phase 5: Hauling begins with the mechanical winch; the seine ropes are slowly pulled back on board, followed by the wings, while the vessel's engine attempts to balance the force applied to retrieve the net. The vessel, however, must not exert too great a draw otherwise the net, if subject to a bigger force, would tend to close on itself and lift off the seabed thus interrupting the catch action. Every 6 m along the seine ropes, some markers allow the net to be recovered in a balanced manner. Another reference point is the buoy at sea which must stay at the centre of the mouth of the net.

Phase 6: While recovery of the seine ropes and wings is mechanical, the body and cod-end are hauled on board manually. For this final operation, the boat is positioned sideways, and the cod-end is hoisted/lifted on board and the contents are poured into a container.

During the phases of circling and lowering the net the vessel's speed is always low (1-2 knots) and there is no movement at all during the catch of the shoal. This differs substantially from the speed of fishing during bottom trawl (3-4 knots) and mid-water trawl (4-4.5 knots) fisheries.

Transparent goby fisheries do not require the mechanical or electronic support devices that are necessary for bottom trawl fisheries, the only such equipment required is a small mechanical winch. The technical characteristics of this fishery and how the net is deployed are such that large specimens escape capture and only small marine organisms are trapped in the net. The conditions of the sea and weather greatly limit fishing activities, which are only carried out during the daytime because at night the shoals of transparent goby scatter, as is often the case, into gregarious species. They are therefore difficult to identify, consequently, yields are lower and all

economic interest in the fishery is lost. Given its technical characteristics and structure, this net is very similar to trawl fishery nets. However, the catch technique is based on net recovery, instead of trawling and towing.

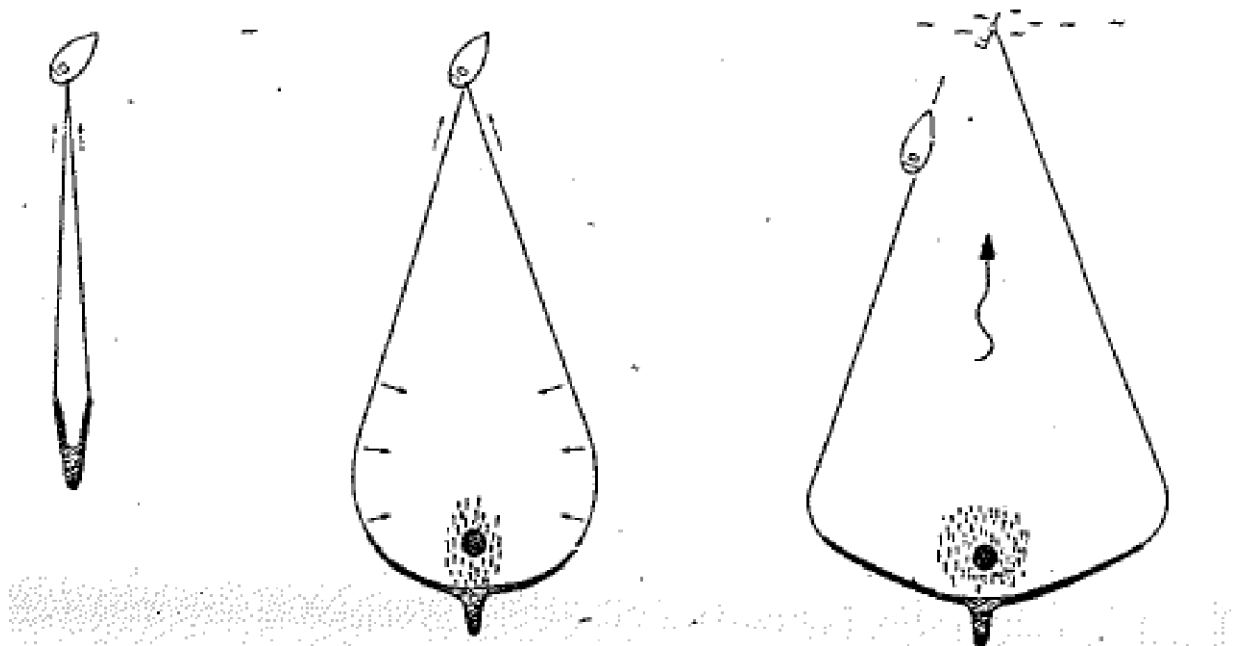


Figure 236 - Diagram of seine fishing operations.

The selectivity of seine fishing nets in Tuscany was analysed by Auteri *et al.* (1989). Two different approaches have been used to determine the length at first catch (L_c); the first approach registers some morphometric measurements of the specimens captured (maximum circumference, maximum height, standard and total length) and analysed specific ratios and relations between these different measurements as described by Pauly (1984). This method gives the length at first catch L_c in seine fisheries for transparent goby (or fish with a similar structure) of 13 mm.

The second approach is based on the analysis of the left side of the catch curve corresponding to classes not completely recruited. In this case, 50% of the recruitment length was 25.3 mm. This difference can be explained by the ethology of the transparent goby, whose early life is pelagic and, only after reaching a certain size

(approximately 20 mm), it changes habits, behaviour, and spatial distribution, gathering in schools, detectable with the echo-sounder and vulnerable to this fishing gear. Consequently, a potential theoretical L_c of 13 mm can be considered and an L_c of 25 mm for the population vulnerable to exploitation by seine fisheries.

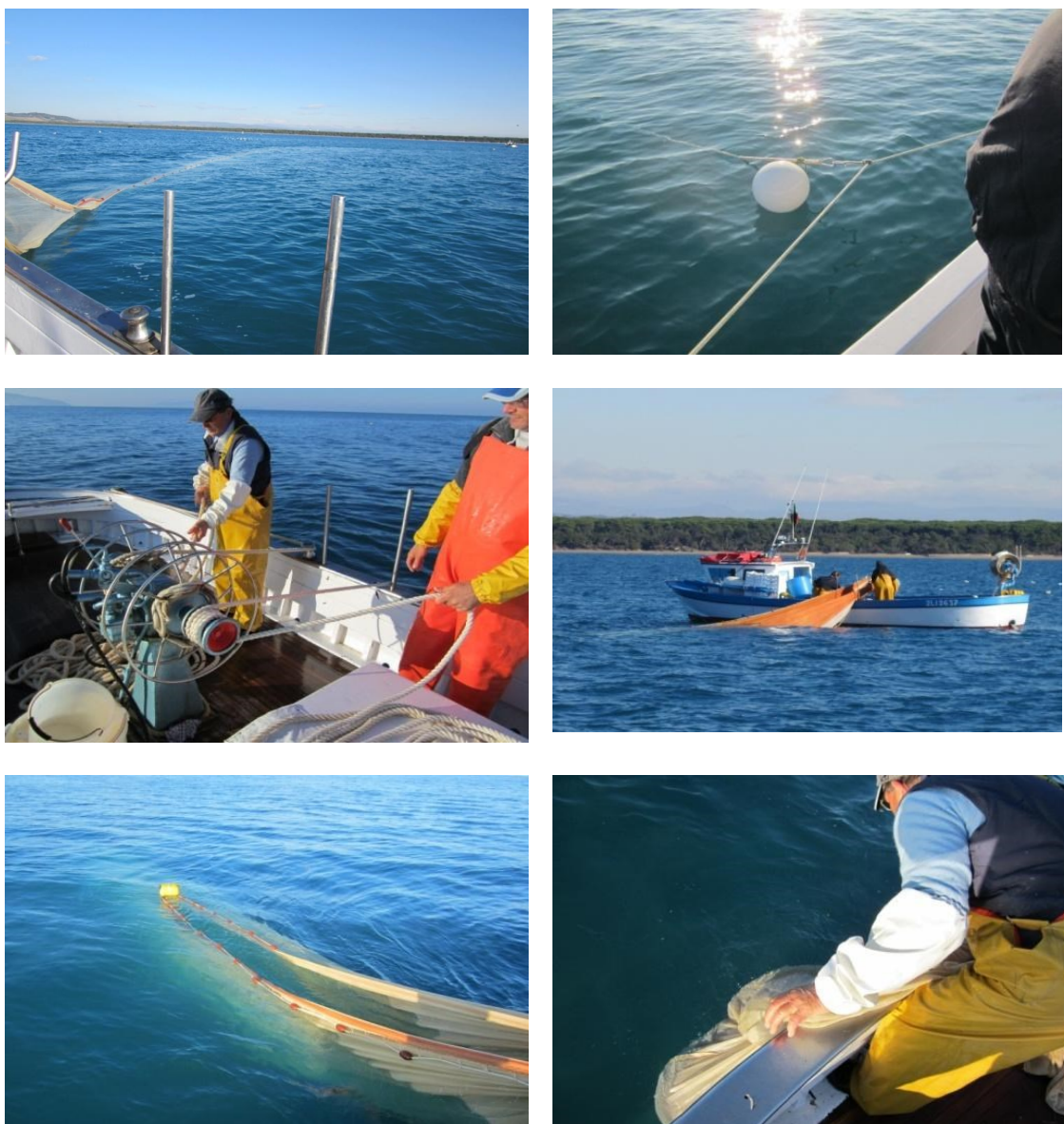


Figure 247 - Pictures of fishing operations by seine vessels.

FEASIBILITY STUDY ON THE USE OF BOAT SEINES IN THE MANFREDONIA FISHING DISTRICT

The European Union Regulation on Mediterranean fisheries has made it no longer possible to fish transparent goby (*Aphia Minuta*) with trawl nets. Previous, successful experience in other areas of Italy (GSA 9) demonstrated that seine fisheries have all the necessary characteristics to be employed notwithstanding these Regulations. Transparent goby fisheries using seine vessels are highly selective, so much so that these fisheries can be considered mono-specific; moreover, the impact of this fishing method on the marine environment is negligible. Since 2003, experimentations have begun on the use of seine nets on vessels in the Manfredonia fleet which previously would use trawl nets for transparent goby fisheries. These preliminary tests concluded with two specific studies, the first was carried out between the end of 2011 and the beginning of 2012 (CIBM, 2012), and the second from April 2012 to May 2013 (CIRSPE e INEA, 2013). These two studies aimed, *inter alia*, to verify the feasibility of seine fisheries in Manfredonia using the gear employed by a fleet in GSA 9 (Livorno), taking advantage of the know-how provided by the fishers from Livorno.

4.3. Knowledge of the gear and the fishery techniques

During the course of the experimentation carried out in 2011–2012 and 2012–2013, technical knowledge was acquired on the use of seine net vessels. In particular technical aspects of this gear and the procedures to follow for its use, were analysed and studied through the participation and collaboration of the fishers from the Livorno fleet fishing district, where seine nets are traditionally utilized in transparent goby fisheries.

In 2011, the fishers from Manfredonia, who were involved in the experimental studies, visited Tuscany to see the vessels and the nets used by the Livorno fleet and to further their understanding of the technical aspects as well as the construction of the gear.

During the 2011–2012 fishing season experimental tests were carried out on a small scale with researchers on board, selecting three vessels from the Manfredonia fleet and employing seine nets belonging to the fishers from Livorno. During these tests, the fishery operators from Manfredonia acquired the necessary knowledge concerning the correct use of the seine net from the Livorno fishers who were also on board, they also developed awareness of technical and practical aspects of this type of fishery (Figure 28 and Figure 28).

During the 2012–2013 fishing season, the scope of the experimentation was extended to 100 vessels. Following the Directives received from the Italian Ministry (MiPAAF), the experimental fisher operations were carried out by 30 vessels per day for a total of four days per week, from Monday to Thursday, rotating weekly to involve the 100 vessels that took part in the test. All the transparent goby fished during the experimental period was assigned to the New Fish Market in Manfredonia. During the experimentation carried out in 2012–2013 and, in particular, during the December 2012 - April 2013 season, the training component was intensified through the organization of informative seminars, practical demonstrations, training sessions and consultations involving the fishery operators of the Manfredonia fleet. To carry out these activities, the experience and knowledge of a professional fisher from Livorno

was appointed drawing upon his 20-year experience in the use of seine net vessels for transparent goby fisheries.

In the same period, 2012–2013, experimental fishery activities were carried out with both researchers and fishers from the Livorno fleet on board.

On 7th March 2014, the Italian Ministry of Agricultural and Forestry Policies (MIPAAF) forwarded the Note no. 614692 of the European Commission concerning the Management Plan for the Transparent Goby fishery with the boat seine, in the Fishing District of Manfredonia, requesting further details for:

- Catch composition, as well as by-catch, also concerning the observation of the criteria set by the art. 13 of the Reg. CE 1967/2006 and considering the land obligation set by the art. 15 of Reg. CE 1380/2013;
- Technical details of the fishing activities displaying the reasons why it cannot be performed outside the 3 miles limit from the coast;
- Monitoring and control measures for transparent goby fishery;
- supplementary socio-economic issues regarding the fishing companies and workers concerned.

To acquire further technical-scientific data, requested by the MIPAAF and the European Commission, the continuation of experimental fisheries campaign has been granted, according to the issues of 2011-2012 and 2012-2013 fisheries campaigns reported in the MIPAAF note No. 1588 of 28th January 2013, until 15th April 2014 and, subsequently, extended until 30th April 2014. An additional continuation of the experimental campaign was granted for the 2015 fishing season until 31st May, to further enrich the historical series of available data.



Figure 258 - Pictures of the tests carried out on board the vessels from Manfredonia, under the supervision of the fishers from the Livorno fleet.



Figure 269 - Pictures of the seine nets from the Leghorn fleet used in the tests carried out on board the vessels from Manfredonia.

4.4. Experimentation: 2011-2012

The trials using seine nets were completed using three vessels from the Manfredonia fleet (overall length is between 13 and 16 m; engine power between 30 and 100 Kw; tonnage between 17 and 21 t). Over five days, 47 tests were carried out on the use of the seine net (Figure 30).

The experimental fishery operations were executed according to the techniques and knowledge acquired during the first phase of the study. The crews involved in the experimentation proved that they could manoeuvre the vessels correctly to correctly operate seine nets (Figure 31).

The main result of the tests was the demonstration of the feasibility of the utilization of seine nets. Experimental fishing operations resulted in the capture of transparent goby specimens thus proving that the gear is suitable to fish this species (Figure 32).

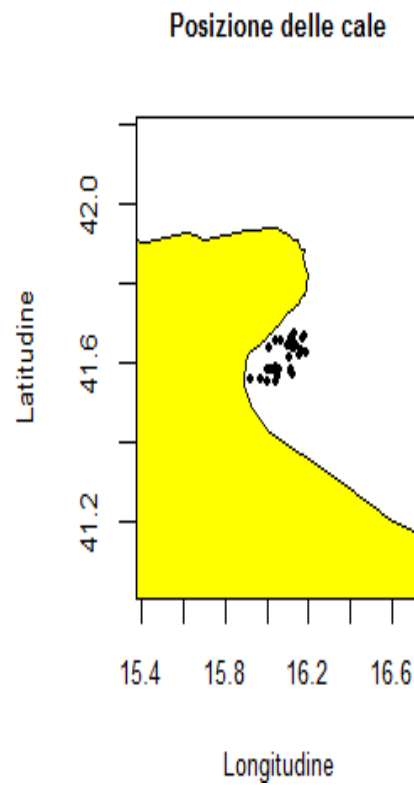


Figure 30 - Position of the experimental hauls carried out in the



Figure 31 - Pictures of the experimental fishing operations with seine nets in the Gulf of Manfredonia in 2012.



Figure 272 - Pictures of transparent goby specimens caught during the experimental fishing campaign using seine nets in the Gulf of Manfredonia in 2012.

Figure 33 shows the length-frequency distribution of *A. minuta* obtained from the samples caught during the experimental campaign in the Gulf of Manfredonia.

The graph demonstrates the presence of at least three demographic components: the first assigned to a modal length class of 27 mm total length, the second 34 mm total length and the third 45 mm total length. These data demonstrate that the transparent goby population in the Gulf of Manfredonia is well structured, with both adult and young (total length < 30mm) specimens.

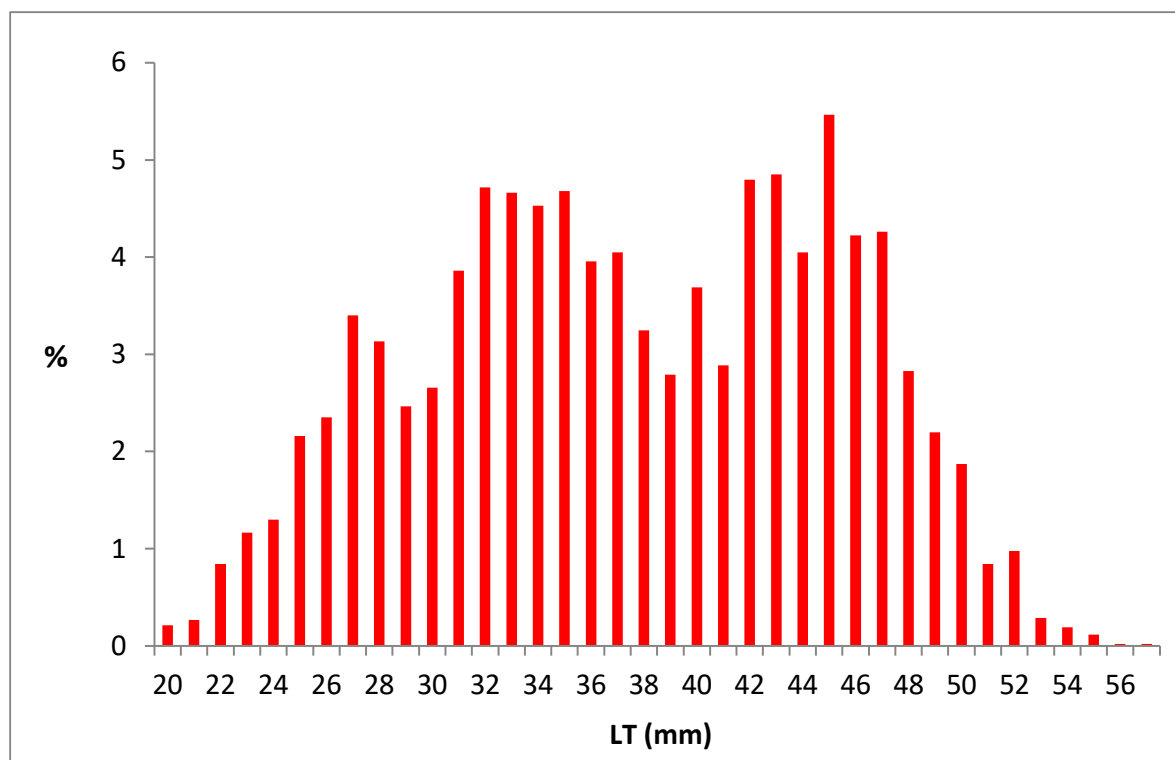


Figure 283 - Length-frequency distribution of *Aphia minuta* in the Gulf of Manfredonia in 2012.

4.5. Experimentation 2012-2013

The experimental phase and the data collection carried out in 2012 – 2013 were divided into two sub-activities:

- Experimentation of the seine net on all 100 vessels that took part in the exercise.
- Training and data collection employing the seine nets fitted onto two vessels that participated in the exercise.

Experimentation of the seine net on the 100 vessels taking part in the trials

The experimental fisheries campaign targeting transparent goby and using seine nets and surrounding nets without closure took place from 4th February to 30th April 2013. Following the directives from the Italian ministry MIPAAF, the experimentation in question was authorized for 30 vessels per day for a total of four days per week (Monday to Thursday), with weekly rotation to involve all 100 vessels.

By rostering the fishing vessels, no growth of the fishing effort occurred, considering that no more than 30 vessels per day could operate. The turnover system has allowed a larger number of vessels, which in the past used to fish with trawling nets targeting transparent goby, to benefit from this traditional and profitable fishery.

Due to the information gathered from the vessels participating in the project, an area was identified in which the experimental hauls were carried out. Table 20 and Figure 34 respectively show the coordinates of the fishing area and the area in which the experimental hauls for transparent goby were carried out in 2013.

Table 20 - The points that mark the area in which the experimental hauls for transparent goby were carried out in 2013 (the coordinates are expressed in decimals).

Point identifier	Latitude	Longitude
1	41.41598	16.34159
2	41.46240	16.22125
3	41.50692	16.11019
4	41.56270	16.03131
5	41.60514	16.12958
6	41.67317	16.24024
7	41.76536	16.32410
8	41.83384	16.33173
9	41.91700	16.31313
10	41.97887	16.24718
11	42.02093	16.16622
12	42.04606	16.09209
13	42.05005	16.02818



Figure 294 - The boundary of the area in which the experimental hauls for transparent goby were carried out in 2013.

The quantities of transparent goby caught daily by each fishing enterprise (Table 21) were recorded at the Manfredonia fish market together with the relevant selling price (Table 22).

From 4th February to 30th April 2013, 41 days of experimental fishing activities were carried out, a rather lower number compared to the past, due to the adverse weather and sea conditions as well as the complex procedures to organize and authorize the activities, which together limited the fishing period.

A total of 961 fishery operations were carried out with an average of 23 vessels per day, the minimum being 5 vessels and the maximum 30 vessels per day.

Table 21 - Data related to the quantity of transparent goby caught during the 2013 experimental fishing campaign as recorded by the Manfredonia fish market.

Date	Number of vessels/day	Total daily catch (kg)
04/02/2013	14	660.00
05/02/2013	25	2 285.50
06/02/2013	24	2 456.50
07/02/2013	24	2 289.00
11/02/2013	27	2 710.00
12/02/2013	8	385.00
13/02/2013	15	844.50
14/02/2013	27	1 288.00
18/02/2013	30	2 807.50
19/02/2013	24	2 221.50
20/02/2013	24	2 253.50
21/02/2013	25	1 316.00
25/02/2013	28	2 017.00
26/02/2013	26	2 141.50
11/03/2013	27	514.50
12/03/2013	27	1063.50
13/03/2013	27	919.50
14/03/2013	15	213.50
20/03/2013	24	295.00
21/03/2013	9	98.00
25/03/2013	5	600.00
26/03/2013	15	116.50
27/03/2013	27	600.00
28/03/2013	27	1119.50
02/04/2013	28	1053.00
03/04/2013	25	841.00
04/04/2013	29	1 402.50
08/04/2013	28	640.50
09/04/2013	29	1831.00
10/04/2013	27	1757.50
11/04/2013	28	1644.00
15/04/2013	30	1019.00
16/04/2013	29	1275.00
17/04/2013	29	1809.50
18/04/2013	27	1112.50
22/04/2013	27	773.00
23/04/2013	19	1036.00
24/04/2013	19	510.00
25/04/2013	13	367.00
29/04/2013	25	600.00
30/04/2013	25	895.00
Total	961	49 782.00

Table 17 - Data related to the quantity, retail price and overall income for transparent goby caught during the 2013 experimental fishing campaign as recorded by the Manfredonia fish market.

Date	Total <i>A. minuta</i> (kg)	Average daily price €	Daily income €
04/02/2013	660.00	17,50	11 550.00
05/02/2013	2285.50	13,50	30 854.25
06/02/2013	2456.50	13,50	33 162.75
07/02/2013	2289.00	13,50	30 901.50
11/02/2013	2710.00	17,50	47 425.00
12/02/2013	385.00	32,50	12 512.50
13/02/2013	844.50	24,00	20 268.00
14/02/2013	1288.00	19,50	25 116.00
18/02/2013	2807.50	13,50	37 901.25
19/02/2013	2221.50	13,50	29 990.25
20/02/2013	2253.50	13,50	30 422.25
21/02/2013	1316.00	14,50	19 082.00
25/02/2013	2017.00	13,50	27 229.50
26/02/2013	2141.50	13,50	28 910.25
11/03/2013	514.50	27,50	14 148.75
12/03/2013	1063.50	17,50	18 611.25
13/03/2013	919.50	24,50	22 527.75
14/03/2013	213.50	27,45	5 860.58
20/03/2013	295.00	28,50	8 407.50
21/03/2013	98.00	29,00	2 842.00
25/03/2013	600.00	20,00	12 000.00
26/03/2013	116.50	29,00	3 378.50
27/03/2013	600.00	28,50	17 100.00
28/03/2013	1119.50	26,00	29 107.00
02/04/2013	1053.00	24,00	25 272.00
03/04/2013	841.00	20,00	16 820.00
04/04/2013	1402.50	19,50	27 348.75
08/04/2013	640.50	25,50	16 332.75
09/04/2013	1831.00	20,00	36 620.00
10/04/2013	1757.50	18,00	31 635.00
11/04/2013	1644.00	15,00	24 660.00
15/04/2013	1019.00	19,00	19 361.00
16/04/2013	1275.00	18,50	23 587.50
17/04/2013	180950	18,50	33 475.75
18/04/2013	1112.50	11,00	12 237.50
22/04/2013	773.00	11,50	8889.50
23/04/2013	1036.00	13,00	13 468.00
24/04/2013	510.00	12,00	6 120.00
25/04/2013	367.00	12,00	4 404.00
29/04/2013	600.00	17,50	10 500.00
30/04/2013	895.00	17,00	15 215.00
Total	49 782.00		845 255.58

Total daily catch varied from 98 to 2808 kg, with an average of 1.214 kg. Catch quantity per vessel per day was 51.8 kg for the entire period.

In total, 49.782 kg of transparent goby were caught with an average price of 18 euro/kg for the entire period. The minimum price was 10 euro/kg and the maximum price was 35 euro/kg. This retail price is lower than expected and significantly less than in GSA 9 (Liguria and Tuscany) where the price during the 2012 fishing season varied between 30 and 60 euro/kg with an average of 45 euro/kg (Cavalletti and Tudini, 2013).

The estimated total earnings for the experimental fishery campaign in 2013 were 845.255,58.

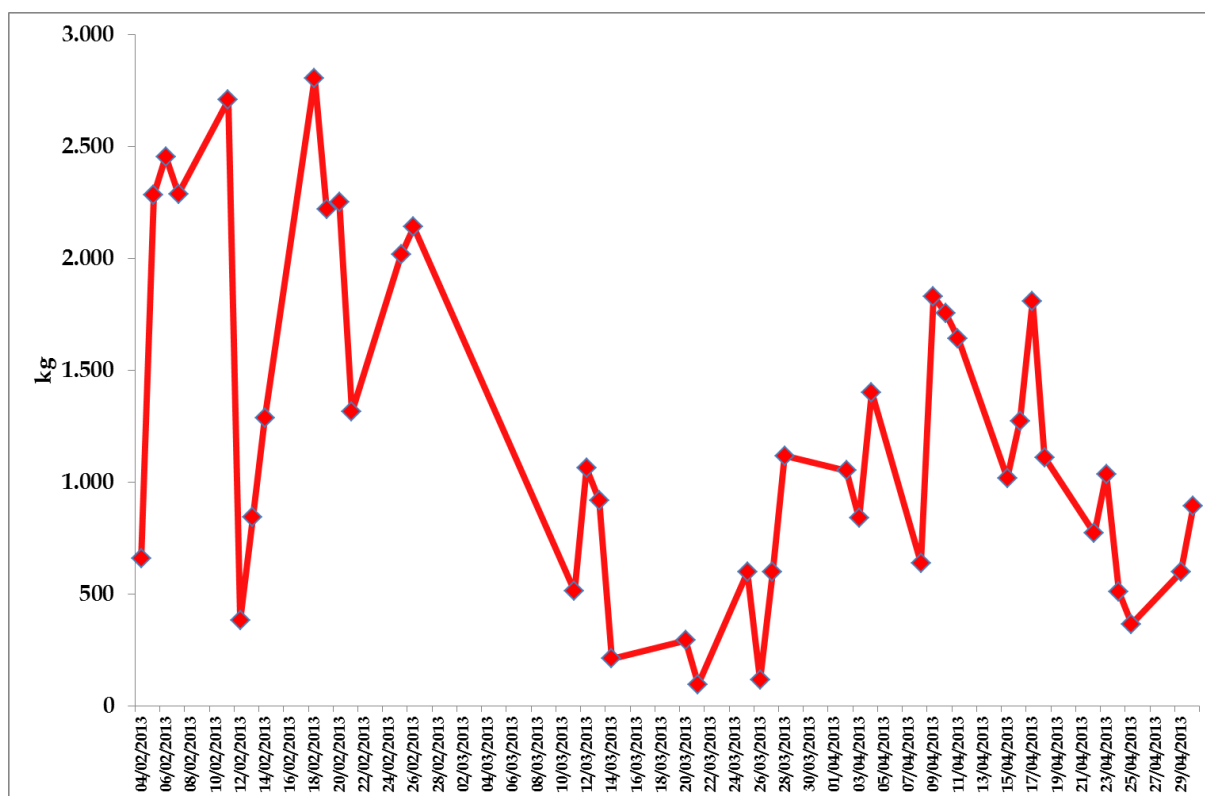


Figure 305 - Total daily catch trends during the 2013 fishing campaign

Comparing the results of the experimental fishing activities, carried out in 2013 with seine nets by the 100 vessels of the Manfredonia fleet which took part in the project, and the historical data (1996 – 2010), related to trawling fisheries in the Manfredonia district, we can deduce the following information:

- The number of fishing days during 2013 experimentation was 41, much lower than the historical data in which fishing days varied from 55 to 108.
- The daily catch per vessel in 2013 was 51.8 kg, significantly more than in the previous years when the average was 19 kg/vessel/day. This higher value registered in 2013 could be due to various factors – the particular abundance of resources and the fact that in the two years before the campaign 2011 and 2012 the resource was not targeted, besides there, could also be technical reasons for the value. In the past, trawl fisheries carried out in the Manfredonia fishing district targeted whitebait (juveniles of *Sardina pilchardus*) and transparent goby was of secondary interest. According to EC Reg. no. 1967/2006, coming into force on 1st June 2010, it is only possible to fish juveniles of any species for commercial purposes if this fishery is contemplated within an approved management plan (art. 15), and therefore in the experimental activities described in this paper. The yield in the experimental period, per the returns for the years 1999–2010, confirms the abundance of this resource in the area.
- The total number of fishing days in 2013 was 951, significantly fewer than the average for fishery activities in 2009 – 2010 when the average number of days per season was 5039.
- Regarding catch composition and the selectivity of the seine net used in the 2013 experimental campaign by all 100 vessels, the data obtained are insufficient to draw conclusions. By-catch was extremely variable during the monitoring period, although the percentage of by-catch was lower on average compared to the one caught during trawl fishery operations, and records of these data were sporadic and inaccurate.

Training carried out for the use of seine nets on two vessels participating in the project

This paragraph provides information on the training carried out on two vessels equipped with seine nets similar to those used by the Tuscan fleets. The project also aimed at developing the technical capacity of the fishers; thanks to their structural features and their technical equipment on board, 2 out of 100 vessels were identified as suitable for the training of operators on the use of the gear in question. These two vessels were modified as necessary (echo-sounder, power block, etc.) and the experimental seine net (developed during the initial stage of training) was used. As well as the crew, during the training exercise, a fisher from the Livorno fleet, with 20-year experience in using the seine net for transparent goby fisheries, was taken on board together with the researchers. The following vessels were used for the training exercise (Table 23):

Table 18 - Technical characteristics of the vessels used for the training exercises and data collection on seine fisheries in 2013.

Registration number	Vessel name	LPP (m)	Gross tonnage (GT)	Engine power (kW)
00MF03013	ADRIATICA II [^]	12.62	17	108.8
00MF03273	VINCENZO PADRE	13.66	15	103.3

In the period from 6th February to 28th March 2013, a 7-day training was carried out using the seine net installed on the vessels chosen for the tests according to their technical features.

Figure 36 shows the geographical location of the hauls carried out, while Table 24 provides the technical information, such as weather and sea conditions, haul time, geographical coordinates in decimals and depth, related to the 45 hauls carried out in the Gulf of Manfredonia.

The number of hauls was limited by poor weather and sea conditions in the period February/March 2013. Hauls were performed under favourable weather and sea conditions, where possible. Nonetheless, in the case of non-optimal conditions, some hauls were also accomplished. The crews of the two vessels, involved in the

experimentation, cooperated successfully with the fisher from Livorno, providing technical information on the specific vessel and the fishing area. The crews demonstrated the ability to manoeuvre the vessels correctly, to apply the appropriate fishing technique with seine nets (Figure 37).

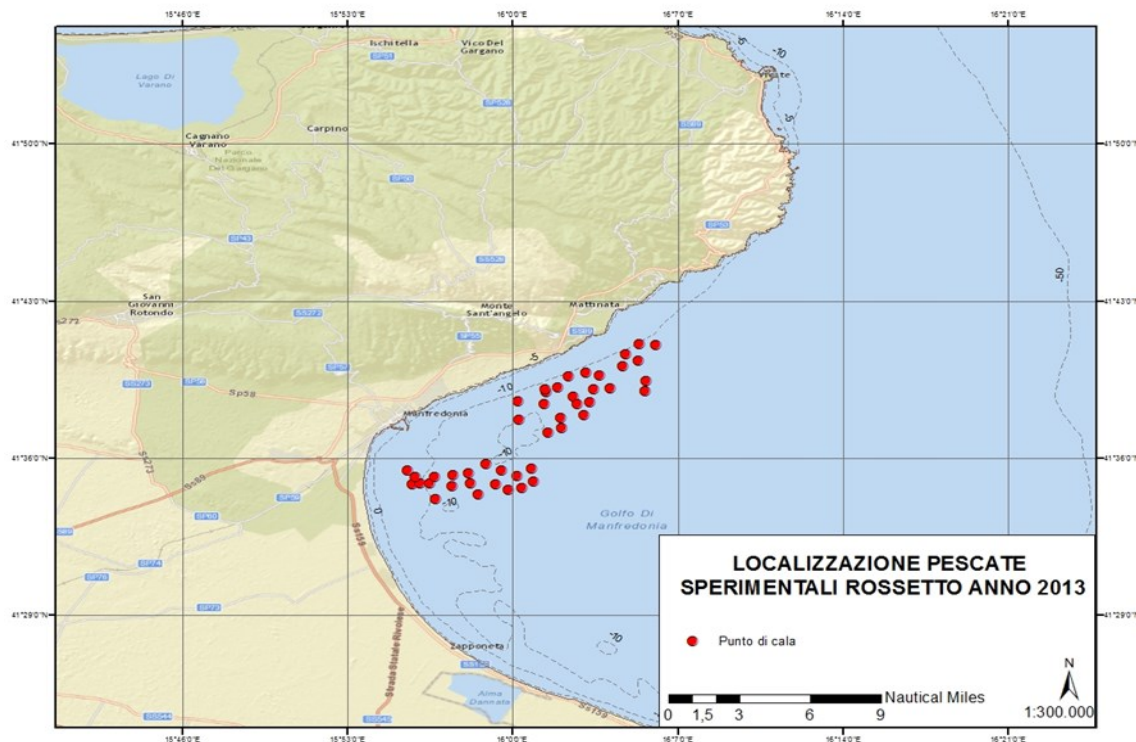


Figure 316 - Position of the experimental hauls of transparent goby in the Gulf of Manfredonia in 2013.

The hauls lasted 17 minutes on average, ranging from 11 to 39 minutes. The depth varied from 6 to 17 meters with an average of 10.87 m. Transparent goby specimens were present in all the hauls. By-catch species were small pelagics, sardine and anchovy, as well as more distinctly benthic species such as hake *Merluccius merluccius*, mantis shrimp *Squilla mantis*, Mediterranean scaldfish *Arnoglossus laterna* and the gastropods murex *Bolinus brandaris* and pelican's foot *Aporrhais pespelecani*. Annular seabream *Diplodus annularis* and red mullet *Mullus barbatus* were also quite frequently present in the hauls. 2 out of 27 hauls contained specimens of whitebait (*S. pilchardus* juveniles).

Catch composition was similar to that observed in previous studies realized in the Gulf of Manfredonia on transparent goby with bottom trawl nets (Ungaro *et al.*, 1994; Casavola *et al.*, 1999b).

Table 194 - Information related to the hauls carried out in 2013.

No	Date	Fishing vessel	Sky	Sea	Wind	Time of haul		Haul length (min)	Latitude	Longitude	Depth (m)
						Start	End				
1	06/02/2013	Vincenzo Padre	clear	calm	absent	08:52	09:15	00:23	41,68472	16,08944	6.00
2	06/02/2013	Vincenzo Padre	clear	calm	absent	09:53	10:08	00:15	41,67250	16,08889	12.00
3	06/02/2013	Vincenzo Padre	clear	calm	absent	10:38	11:17	00:39	41,64556	16,04278	12.00
4	06/02/2013	Vincenzo Padre	clear	calm	absent	11:54	12:12	00:18	41,66861	16,07806	12.00
5	06/02/2013	Vincenzo Padre	clear	calm	absent	12:45	12:59	00:14	41,66389	16,05167	6.50
6	06/02/2013	Vincenzo Padre	clear	calm	absent	13:15	13:34	00:19	41,64028	16,04583	14.00
7	07/02/2013	Vincenzo Padre	clear	calm	light	09:15	09:38	00:23	41,65750	16,09417	14.00
8	07/02/2013	Vincenzo Padre	clear	calm	light	10:11	10:36	00:25	41,64972	16,09361	14.00
9	07/02/2013	Vincenzo Padre	clear	calm	light	11:06	11:29	00:23	41,65194	16,06861	12.00
10	07/02/2013	Vincenzo Padre	clear	calm	light	11:50	12:02	00:12	41,64139	16,05472	12.00
11	07/02/2013	Vincenzo Padre	clear	quite calm	moderate	12:10	12:24	00:14	41,63028	16,03389	11.00
12	07/02/2013	Vincenzo Padre	clear	quite calm	moderate	12:45	13:01	00:16	41,61917	16,02500	10.00
13	08/02/2013	Vincenzo Padre	clear	slightly rough	moderate	09:16	09:31	00:15	41,58056	15,92917	7.00
14	08/02/2013	Vincenzo Padre	clear	quite calm	light	09:54	10:18	00:24	41,58111	15,93472	6.00
15	08/02/2013	Vincenzo Padre	clear	calm	light	10:48	11:05	00:17	41,58611	15,93111	6.00
16	08/02/2013	Vincenzo Padre	clear	calm	absent	11:31	11:50	00:19	41,59111	15,92556	8.00
17	08/02/2013	Vincenzo Padre	clear	quite calm	moderate	12:21	12:34	00:13	41,57000	15,94556	8.00
18	08/02/2013	Vincenzo Padre	clear	slightly rough	moderate	12:55	13:14	00:19	41,58111	15,94167	12.00
19	12/03/2013	Adriatica II	clear	slightly rough	moderate	09:00	09:18	00:18	41,62278	16,03444	12.00
20	12/03/2013	Adriatica II	clear	quite calm	light	09:35	09:48	00:13	41,63222	16,05056	10.98
21	12/03/2013	Adriatica II	clear	calm	light	10:25	10:41	00:16	41,65139	16,05722	10.61
22	12/03/2013	Adriatica II	clear	calm	absent	10:54	11:12	00:18	41,66167	16,06167	10.61
23	12/03/2013	Adriatica II	clear	quite calm	moderate	11:35	11:49	00:14	41,67750	16,07972	10.98
24	12/03/2013	Adriatica II	clear	slightly rough	moderate	12:10	12:26	00:16	41,68417	16,10083	10.98
25	26/03/2013	Adriatica II	clear	calm	absent	09:20	09:32	00:12	41,62861	16,00472	9.15

26	26/03/2013	Adriatica II	clear	calm	absent	09:46	09:59	00:13	41,64222	16,00361	11.00
27	26/03/2013	Adriatica II	clear	calm	absent	10:14	10:25	00:11	41,64917	16,02361	9.52
28	26/03/2013	Adriatica II	clear	calm	absent	10:40	10:57	00:17	41,66083	16,03944	9.33
29	26/03/2013	Adriatica II	clear	calm	absent	11:12	11:25	00:13	41,65139	16,02306	9.88
30	26/03/2013	Adriatica II	Clear	calm	Absent	11:49	12:03	00:14	41,65250	16,03194	10.98
31	26/03/2013	Adriatica II	Clear	calm	Absent	12:15	12:28	00:13	41,64028	16,02250	11.35
32	27/03/2013	Adriatica II	cloudy	slightly rough	moderate	09:06	09:22	00:16	41,57944	15,95694	10.80
33	27/03/2013	Adriatica II	cloudy	slightly rough	moderate	09:36	09:52	00:16	41,57306	15,97556	10.98
34	27/03/2013	Adriatica II	cloudy	slightly rough	moderate	10:05	10:19	00:14	41,58167	15,97056	10.98
35	27/03/2013	Adriatica II	cloudy	slightly rough	moderate	10:26	10:43	00:17	41,58056	15,98833	11.53
36	27/03/2013	Adriatica II	cloudy	slightly rough	moderate	10:59	11:15	00:16	41,57639	15,99694	11.16
37	27/03/2013	Adriatica II	cloudy	slightly rough	moderate	11:25	11:40	00:15	41,58889	15,96889	10.98
38	27/03/2013	Adriatica II	cloudy	slightly rough	moderate	11:55	12:11	00:16	41,58778	15,95778	11.35
39	27/03/2013	Adriatica II	cloudy	slightly rough	moderate	12:29	12:44	00:15	41,58639	15,94472	10.98
40	28/03/2013	Adriatica II	rain	slightly rough	moderate	06:15	06:37	00:22	41,59250	16,01333	12.00
41	28/03/2013	Adriatica II	rain	slightly rough	moderate	06:50	07:05	00:15	41,58250	16,01500	13.00
42	28/03/2013	Adriatica II	rain	slightly rough	moderate	07:20	07:36	00:16	41,57778	16,00667	14.64
43	28/03/2013	Adriatica II	rain	slightly rough	moderate	07:55	08:11	00:16	41,58667	16,00306	16.47
44	28/03/2013	Adriatica II	rain	slightly rough	moderate	08:33	08:53	00:20	41,59111	15,99222	11.53
45	28/03/2013	Adriatica II	rain	slightly rough	moderate	09:15	09:32	00:17	41,59583	15,98139	12.81



Figure 327 - Pictures of fishing activities with seine nets in the Gulf of Manfredonia.

Figure 38 shows the length-frequency distribution of *A. minuta* obtained from samples caught during the experimental campaign in 2013 in the Gulf of Manfredonia. The graph demonstrates the presence of at least two demographic components: the first with a modal length of 28 mm TL and the second 34 mm TL. This proves that the transparent goby

population in the Gulf of Manfredonia is well balanced, with both adults and juveniles (< 30 mm LT).

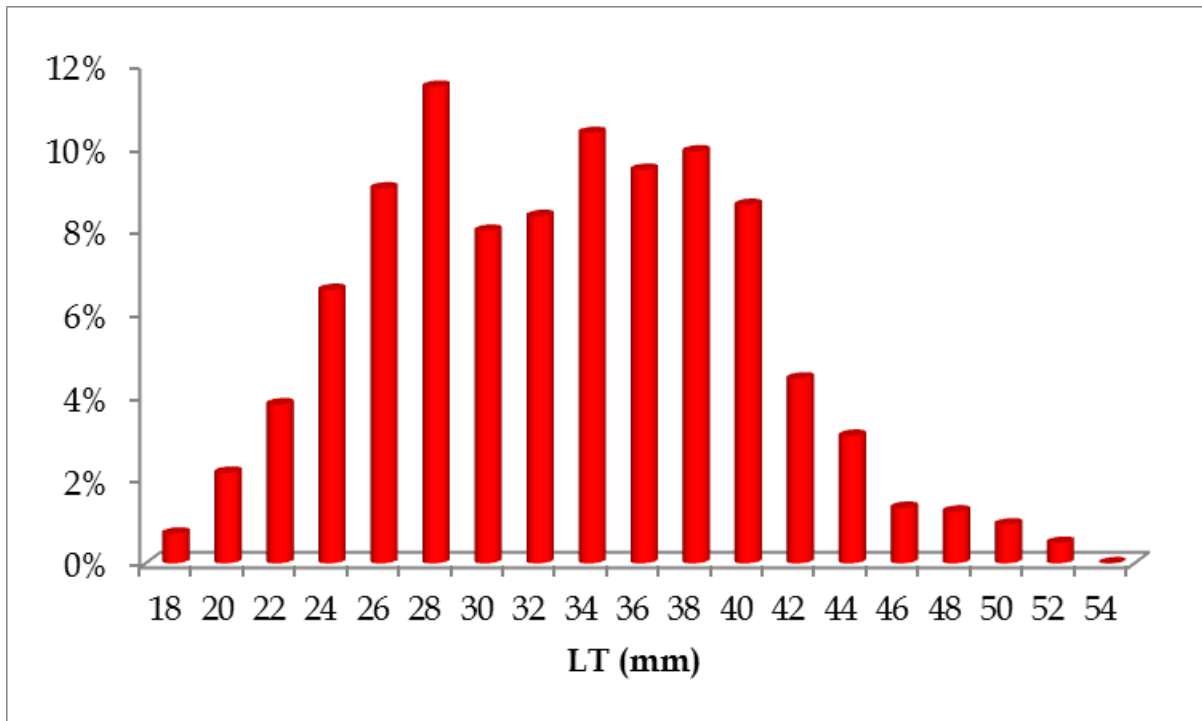


Figure 338 - Length frequency distribution of *A. minuta* in the Gulf of Manfredonia in 2013.

4.6. Experimental campaign 2014

The 2014 trials requested by the European Commission and MiPAAF sought to acquire further technical-scientific data to integrate the information collected during the 2011-2012 and 2012-2013 fishing campaigns.

The transparent goby experimental fishing campaign, using the boat seine, was carried out from 17th March to 30th April 2014 involving the same 100 vessels joining the Manfredonia fishing district, which were included in the experimental activities in 2012-2013 and are involved in the Management Plan.

Based on the information collected with logbooks by the vessels involved in the transparent goby fishery, and the schedule submitted to the Port Authorities of Manfredonia, the area,

where fishing trials occurred in 2014, has been identified. The determined area was the same established by the experimental campaign in 2013 (Fig. 36).

The daily catch of transparent goby for each vessel was registered by the Port Authority of Manfredonia (Table 25). Sales prices have been recorded at the fishing market in Manfredonia (Table 26).

Between 17th March and 30th April, only 24 experimental fishing days have been carried out, resulting in a quite limited number compared to the past, because of the short fishing period.

A total of 276 fishing days were conducted, with an average of 11,5 vessels per day, a minimum of 1 and a maximum of 19 vessels per day.

Table 25 - Transparent goby catch from 2014 experimental campaign reported by

Date	Number of vessels/day	Total of daily catch (kg)
17/03/2014	4	338,00
18/03/2014	9	912,50
19/03/2014	14	1.443,00
20/03/2014	19	1.471,00
24/03/2014	3	202,00
25/03/2014	15	850,00
26/03/2014	10	728,00
27/03/2014	1	90,00
31/03/2014	15	1.228,00
01/04/2014	18	1.541,50
02/04/2014	17	1.275,00
03/04/2014	16	1.336,00
04/04/2014	2	14,00
07/04/2014	13	822,50
08/04/2014	14	1.096,00
09/04/2014	13	726,50
10/04/2014	1	29,00
14/04/2014	14	841,50
15/04/2014	14	606,00
22/04/2014	15	273,50
23/04/2014	6	160,50
25/04/2014	12	224,50
28/04/2014	16	646,00
29/04/2014	15	559,50
Total	276	17.414,50

Table 26 - Catch data reported by the Port Authority in Manfredonia, sales prices registered at the new fishing market in Manfredonia and total income estimated from the experimental fishing campaign in 2014.

Date	Total daily catch (kg)	Daily average price €	Daily income €
17/03/2014	338,00	19,00	6.422,00
18/03/2014	912,50	19,00	17.337,50
19/03/2014	1.443,00	19,00	27.417,00
20/03/2014	1.471,00	19,00	27.949,00
24/03/2014	202,00	18,44	3.724,88
25/03/2014	850,00	18,70	15.895,00
26/03/2014	728,00	18,45	13.431,60
27/03/2014	90,00	19,00	1.710,00
31/03/2014	1.228,00	19,16	23.524,43
01/04/2014	1.541,50	16,44	25.334,99
02/04/2014	1.275,00	15,15	19.318,93
03/04/2014	1.336,00	12,87	17.192,60
04/04/2014	14,00	19,00	266,00
07/04/2014	822,50	17,83	14.662,98
08/04/2014	1.096,00	18,09	19.827,86
09/04/2014	726,50	21,06	15.297,46
10/04/2014	29,00	23,23	673,77
14/04/2014	841,50	20,47	17.221,37
15/04/2014	606,00	22,02	13.343,54
22/04/2014	273,50	19,85	5.429,58
23/04/2014	160,50	28,17	4.521,45
25/04/2014	224,50	25,26	5.671,00
28/04/2014	646,00	20,55	13.277,05
29/04/2014	559,50	20,53	11.485,95
Total	17.414,50	0,00	320.935,93

The total daily catch in 2014 ranged between 14 and 1.541,50 kg, with an average of 725,60 kg. The daily catch per vessel, for the whole period, was 63,10 kg.

A total of 17.414,50 kg of transparent goby was caught, with an average price, for the whole period, of 19 euro/kg. The minimum price was 6 euro/kg, while the maximum was 39 euro/kg. The total estimated income, for the experimental fishing campaign in 2014, was 320.935,93 euros.

During the fishing campaign in 2014, similarly to what was recorded in 2013, the composition in species of the by-catch, was similar to the data gained in the past in the Gulf of Manfredonia concerning the fishing of transparent goby with bottom trawls. By-catch was composed of small pelagic like anchovy, sardine and also by demersal species like hake

(*Merluccius merluccius*), mantis shrimp (*Squilla mantis*), scaldfish (*Arnoglossus laterna*), Gastropoda *Bolinus brandaris* and *Aporrhais pespelecani*. Sargo *Diplodus anularis* and mullet *Mullus barbatus* were quite frequent as well. By-catch species showing minimum catching size (Reg. 1967/06 art. 15) were:

- Sardine (*Sardina pilchardus*, > 11 cm)
- Anchovy (*Engraulis encrasicolus*, > 9 cm)
- Hake (*Merluccius merluccius*, >20 cm)
- Sargo (*Diplodus annularis*, >12 cm)
- Mullet (*Mullus barbatus*, >11 cm).

During the 2014 monitoring, even if trials were limited because of the short period of the experimentation, all the individuals, of species having a minimum catching size, showed a higher size than the one commonly foreseen. Landing of the undersized individuals was therefore not requested and necessary, according to Reg. 1380/13, art. 15. Should undersized individuals ever appear in the implementation of the Management Plan, their landing should be mandatory, together with the application of the human consumption ban.

During the experimental fishing in March-April 2014, **bycatch represented less than 10% of the total catch weight**. For example, taking into account the catching data of Adriatica II, which fits with the general trend also for the other vessels, the total amount of by-catch ranges between 2,44% on 1/4/2014 and 8% on 25/4/2014 (Tab 27).

Table 27 - By-catch and transparent goby catch (grams), by Adriatica II vessel, the experimental campaign carried out in 2014.

Date	T. goby	sardine	anchovy	Hake	Annular seabream	mullet	picarel	pelican-foot	other
31/03/2014	100000	2000	1000	900		250		400	
01/04/2014	100000	300	300			300	540		1000
02/04/2014	80000		500	850		1000		600	
03/04/2014	80000			800		200	2000		450
08/04/2014	117500	400			2000	40		400	
09/04/2014	69000						4000		
14/04/2014	74000	450			600	450			2000
22/04/2014	50000		400		600	200		200	1500
25/04/2014	20000				400	100		300	800
28/04/2014	80500			1000	1000		200	200	
29/04/2014	30000			800					400

As discussed in the chapter "Description of the species", the transparent goby population undergoes seasonal migrations setting the schools near to the coast, between 4-10 meters depth, during the winter and offshore at 20-40 meters depth in spring time.

This is just an explicatory scheme, which is however supported by scientific studies, which range significantly in time, according to different climate conditions. In agreement with the above information, the transparent goby fishery can be undertaken outside the 3 miles from the coast in March, April and May, but it has to take place near the coast in the winter time.

This is the reason why the Management Plan allows fishing **also** within the 3 miles, similarly to what is applied for the GSA 9 (National Management Plan for derogation to mesh size and distance from the coast (Rule (EC) N. 1967/2006, Art. 9) and 13) regarding the use of boat seines for transparent goby (*Aphia minuta*) fishing in GSA 9.

The 100 vessels involved in the experimentation, both in 2013 and 2014, reported in the Management Plan for which the derogation to distance from the coast is requested, are the result of the conversion of the fleet previously operating in Manfredonia with trawlers.

Comparing the results of the experimental fishing campaigns in 2013 and 2014, both carried out by **boat seines** by the same 100 vessels based in the Manfredonia fishing district, the following can be assessed:

- The fishing days in 2014 trials were 24, while in 2013 they were 41. Both values seem to be extremely modest and lower than historical series referring to trawlers which were ranging between 55 and 108 fishing days.
- The quantity of catch per vessel per day was 63,1 kg in 2014 and 51,8 kg in 2013, both similar values and higher than the ones recorded during the past fishing seasons carried out with trawlers, which showed an average value of 19/kg/day/boat. The possible reasons for such high values, can both lie in the nature of the season, and several technical aspects as was described in paragraph 5.3.1. The 2014 and 2013 yields confirm the abundance of the resource in the area, according to the ones recorded from 1999 to 2010.
- The total number of fishing days (276) in 2014 was lower than the ones carried out in 2013 (951), as it was predictable considering the short time for the trials. Both values are lower than the average of the fishing activities in 2009 and 2010 when the average value of 5.039 fishing days per season was recorded.

Figure 39 shows the size-frequency distribution of *A. minuta* gained by the samples collected during the experimental trials in April 2014 in the Gulf of Manfredonia. It is clear from the chart that there are at least two demographic components: the first one with a modal size of 36 mm LT and the second one at 44 mm LT. Such a size-frequency distribution is different from the one recorded during the trials in February and March 2013 when at least two different demographic components were observed: the first one with a modal size of 28 mm LT and the second one at 34 mm LT. This data is attributable to the different periods in which measurements have been performed, earlier in 2013 and later in 2014.

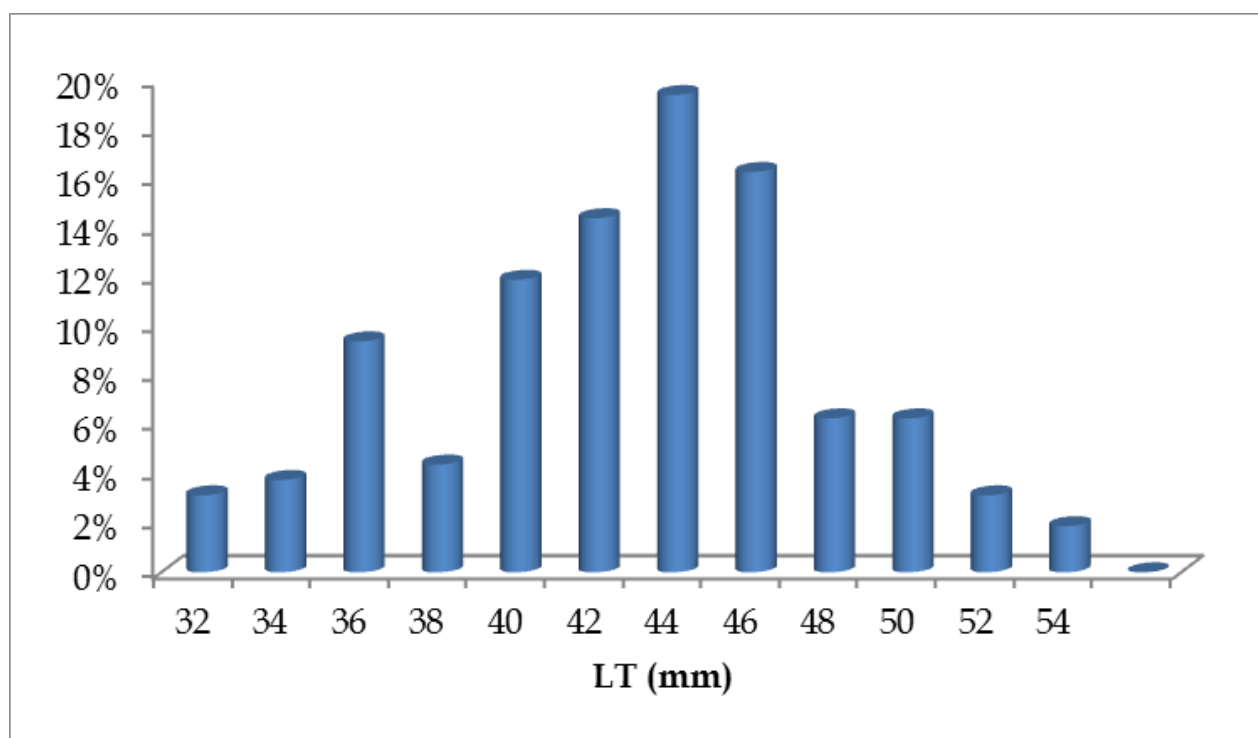


Figure 349 - *Aphia minuta* size-frequency distribution in the Gulf of Manfredonia in April 2014

4.7. Experimental campaign 2015

In the period from March to May 2015 more surveys were conducted with the fishing net called "fonticella" for the capture of transparent goby. The collected data have been used to enrich a series of the available information to monitor the trends in resource abundance.

The Directorate-General for maritime fisheries and aquaculture of the Italian Ministry (MIPAAF/PEMAC) made it possible to perform the surveys, giving the derogation to the distance from the coast and the minimum mesh size.

The authorizations were not released all at once, and some vessels received it too late to take an active part in the surveys. Another reason for the scarce participation of authorized vessels is that every day no more than 30 units (out of the 100 included in the list) could operate.

However, the yields obtained, which fluctuate between 5.5 and 40 kg per vessel per day (Tab. 28), confirmed a good condition of the resource and did not point out any

considerable decline, and remained roughly stable, with regular fluctuations typical of all fish populations influenced by both biological and environmental factors.

The average yield was 26.08 kg/day/vessel, well above the target reference point, fixed with the time series data from 2005 to 2010 in 15 kg/day/vessel.

The yields should not fall to this minimum value for two consecutive fishing seasons, without a need to adopt other restrictions in the following season.

Table 20 - Transparent goby catch from 2015 experimental campaign

Date	Number vessel/day	Total of daily catch (kg)
18/1/15	1	10,5
11/3/15	1	5,5
16/3/15	3	66,5
17/3/15	7	118,5
18/3/15	9	266
19/3/15	8	198
24/3/15	10	269
30/3/15	11	411
31/3/15	8	273
1/4/15	5	168
2/4/15	10	254,5
13/4/15	11	320,5
14/4/15	9	231,5
15/4/15	12	358,5
16/4/15	9	297
22/4/15	2	78
23/4/15	8	230
27/4/15	10	257
28/4/15	2	47
30/4/15	1	10,5
4/5/15	10	314
5/5/15	7	208
6/5/15	10	256,5
7/5/15	4	158
13/5/15	6	152,5
14/5/15	6	127
18/5/15	7	103
19/5/15	4	96,5
20/5/15	1	21,5
21/5/15	1	25
25/5/15	1	24,5
26/5/15	2	80

The graph below shows the average yield/day/vessel, for each operating vessel. The period January - March was characterized by low-medium yields, followed in April – May by higher yields, till 40 kg/day/vessel. There was no by-catch. This is due to the high selectivity of the fishing gear and the good technique adopted by operators. This fishery is highly selective and allows the fishermen to release the few individuals not belonging to the species alive, while *Aphia minuta* remains in the net.

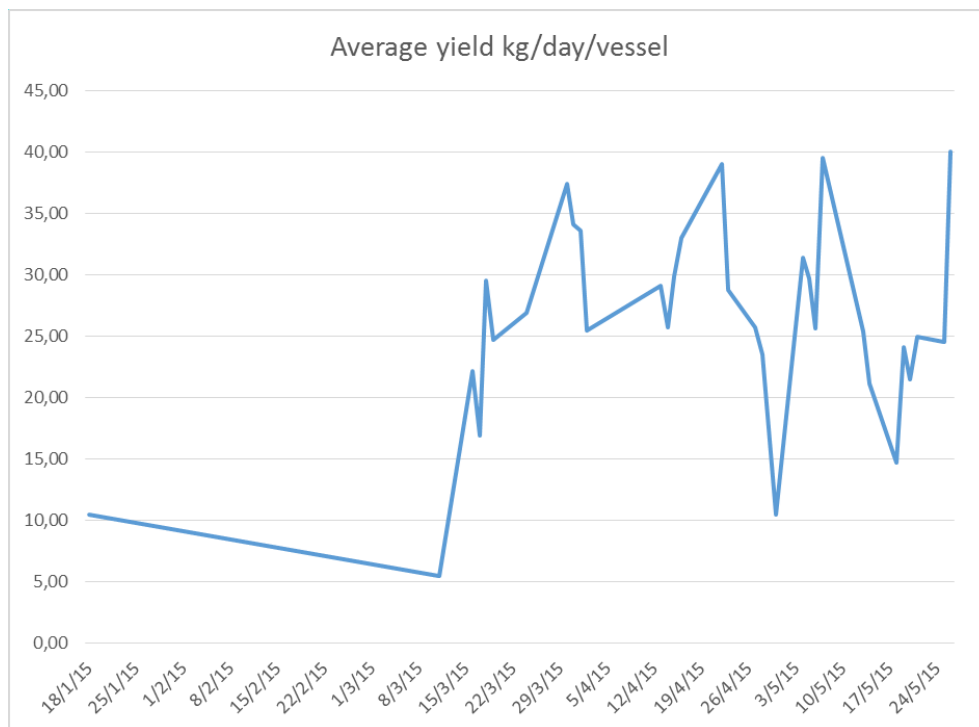


Figure 40 - average yield/day/vessel 2015.

4.8.Experimental campaigns 2018-2019-2020

The experimental fishing campaigns run in 2018, 2019, 2020, after an initial period necessary to set up the operational modalities, have provided data on catches of transparent goby.

In 2018 the beginning of the fishing season has delayed due to some problems in the release of the authorizations. The following charts (Tab. 29, 30 and 31) show the entity of the catches in Kg per day per vessel employed in gathering data. Total catches in the three campaigns (2018, 2019 and 2020) amounted to Kg 22.065, 13.428 and 15.819 respectively.

CPUE values are such that they confirm the fact that the resource is not suffering from the fishing pressure exerted on it.

The few instances of low catch rates are due to the non-ideal weather conditions for this particular type of fishing method.

It is necessary, to operate the haul efficiently, for the sea to be calm or else fishers will not find any convenience in facing the costs and the work needed, being able to foresee the outcomes of poor or null yields. It has to be considered in fact that the data collection goes through a fishery conducted on a commercial basis.

The sporadic minimal catches of some vessels can be explained by the fact that operations were carried out despite weather conditions being at their operational limits and tending to worsen.

The fact that some boats achieved good yields on the same day and others did not, can be explained by the worsening of the marine weather conditions as the hours passed and/or the choice of the best-sheltered area to operate the haul. It often happens those rough seas are preceded by a period of calm, and if the fisher is lucky and skilled enough to take advantage of the favourable moment, he can achieve good results even on bad days. Additionally, he may manage to find a sheltered spot (a stretch of sea sheltered from waves and wind at that specific time) to make an adequate catch.

There was an average per campaign of 64,7 Kg /vessel/day in 2018, 57,6 Kg/vessel/day in 2019, 58,2 Kg/vessel/day in 2020: yields were well above the limit reference point of 15Kg /vessel/day described in section 3.5.

By-catch:

It is important to point out that the value of the product is higher the more mono-specific the catch is, this is a common feature in fisheries for small adult species such as the transparent goby. The fishery in question is in itself very selective. This species congregates in compact schools in certain geographical areas and at particular times of the year. These two elements (space and time) can be considered sufficient to direct activities towards a mono-specific catch. In addition, the net is hauled on board at a very low speed to avoid damaging the product. Immediately before setting sail, for his commercial advantage as well as the desire to conduct an environmentally and resource-friendly fishing method, the fisherman checks the composition of the catch and in case he relinquishes the multi-specific catch.

Nevertheless, the by-catch that occurred in some cases is reported in tables 32-33-34 and marked for species with minimum commercial size and without it.

The percentage is well under the limitation set in the successive paragraph 5.2.e)

Annex 3 shows the by-catch details for each vessel in the triennium

Table 29 - Transparent goby catch from 2018 experimental campaign.

Year 2018 - Kg	APRIL													MAY															
CFR	9	10	11	12	16	17	18	19	23	24	25	26	30	2	7	8	9	10	14	15	16	17	21	22	23	24	28	29	30
ITA000006465		50	100		100	98	95	90	100	100		100	100	100					100		100	95	90	70					
ITA000006474				70	50	80	60	90	80	50		70	70	25	55	55	55	70	70	90	90	90	85	90		20	20		50
ITA000006503	47							53													65							35	
ITA000006529		50	100	70	80	100	80	50	100	60		70	100	80	70	60		150			80	30							
ITA000006566	50	70	70	60	50	70	45	40	25	35		30	45	25	25	25	20	10	20	10	10	20	10	30					
ITA000006684		52	55	20	32	73	31	33	35	31		41	55	58	20	28	53		31		23		28	25					
ITA000006688		100			70	75	40	35	25	35		20	45	20	20	30	10												
ITA000006705	23	170	150		170	90	110	60	150	100		60			30	25	60	60	230	50	30		80	80	50				20
ITA000018665	55	70	82	98	105	95	75	95	65		100	96	90	50	90	99	98	100		98	100	70	100		70	100			
ITA000019425		34	63		30	30			30	30		32	32	28	24	21	25	23	40	37	31	32	32	34			31		
ITA000024799	30	75	90	70	90	98	90	85	90	80		80	80	90	70	70							25	20	40				
ITA000026070	15	45	24		75	45	34	35	45	55		50	80	80	50	40	40		55			45	45	30					
ITA000016902						80	60	20	50	80		100																	
ITA000006506						45	70	40	35	40			38	20	30	20	22	10	10	10	10	10	10	20	20		30	20	
ITA000006692					100	105	95	90	100	95		100	95	105	60	70	100	200	140	150	100	100	90	100		30	120	45	80
ITA000006533										30		30																	
ITA000006653							153	100	80		80																		
ITA000006659										35				13															
ITA000018117		35	70	63	40	40	70	50	70		50	50	50	70	40	45	20	66	74		42	28	28	24					
ITA000019001		30	70	70	20	30																							
ITA000018385	87	67		190	230	315	180	130	70	250		200	98	50	100	100	90	92	93		95		107	70	92				95
ITA000006642	25	40	37		93	111	104	108	107	107		80																	
ITA000027914					60	80		40		35		30	35		20	20					20						30		

Kg/day/vessel average campaign 2018 = 64,7

Table 30 - Transparent goby catch from 2019 experimental campaign.

Year 2019 - Kg	MARCH										APRIL										MAY																				
CFR	18		19		20		21		25		26	8		10		11		15	17	18	23	25	29	2		8		14		15		16		21		23		29		30	
ITA000006465												20	1			53	2								2																
ITA000006474	87		102	4,7	128	5,4	128		230		182								101								100	2	130	2,5	150	4	100	3	100	3	200	3,5	100	2	150
ITA000006503	66		110	5	50	2	100	3	180		100	30	1,5	20	0,9	20	2,5	19	32	19																					
ITA000006529														50		50	2,5	30		45																					
ITA000006566	50	4	55	4	60	4	60	2,6	70		80	20	1	30	1,5	40	1,5	20	26	30	10		10																		
ITA000006622	29		19		68		95		125		100			25		40		20		30				5																	
ITA000006627												30		40		30		30	50																						
ITA000006637												20		30		40		30	28	25																					
ITA000006649	83		100		132		130		150		158			10		20		15		30		120	6	130																	
ITA000006657							100		103		33	10		14		25		23	27	90				47																	
ITA000006684												6		40		60		48	40	98																					
ITA000006688												10		20		35																									
ITA000006696									50		40	25		40		30		30	25	23																					
ITA000006698												16		30		25		26	70	37			5																		
ITA000006705												25		40		45		15	34	37			15	14																60	
ITA000018665	21		80		90		98		80		144			30		52		13	23	20				135																	
ITA000019042												20		25		40		25		25				10																	
ITA000019055																								20								4									
ITA000019425					40		40		140		20	30		15		30		25	33	30				20																	
ITA000024693												20								50																					
ITA000024799												5		90		65		19	25	38				10																	
ITA000025313												25		30		45		20	15	25																					
ITA000025471												30		90		85		73	80	83	40		10																		
ITA000026070	75		95		90		100		140		178			15		81				88																					
ITA000016902												15		30		30		15	25	20																					
ITA000007100	34		15		45		80		100		70																														
ITA000006506	50		60		60		80		130		40																														
ITA000006562									40																																
ITA000006628			23		34		41		150																																
ITA000006658	8								135		230																														
ITA000006690	60		60		64		86		140		50																														
ITA000006692									150		100																														
ITA000006700	70		70		60		80		70		60																														
ITA000006896	60		50		150		90		80		20																														

Kg/ day/vessel average campaign 2019 = 57,6

Table 31 - Transparent goby catch from 2020 experimental campaign.

Year 2020 - Kg	JANUARY									FEBRUARY									MARCH									APRIL								MAY							
CFR	7	8	9	14	15	28	29	30	10	11	12	13	17	18	19	20	24	26	2	3	4	5	9	10	11	6	7	8	14	20	27	28	5	6	13	18	19	20					
ITA000006622		178	104	77	111																																						
ITA000006658			280	207																																							
ITA000006690				87	93																																						
ITA000006472				71	76																																						
ITA000019001				52	43																																						
ITA000002471				32	87																																						
ITA000006896				140																																							
ITA000019425				77	38	47	45	67	7		36	40	31	70	57		36					82	27	71	37					119	128	126											
ITA000006566				76	71																																						
ITA000006503					56																																						
ITA000019055							33	108		58	47	60	45	75	46		61							44	86	93									78	22		52					
ITA000002898								62							33	23	32				5,5		43	28	26		28	48	60	53	45	77	22	60		20	93	33					
ITA000006700	120	133	181																																								
ITA000006620						53,5	50	18	17,5		36		27	40	14,5	26,5	31,5	8																									
ITA000027914				120	114		36,5	46			40	29,5	27	43																													
ITA000006529								55				34	30	49	20,5								44	94						25	23	43											
ITA000006684						30	67	47,5		25	44	38,5	25	31	41																												
ITA000006464				150	125			32			68	48,5	33	50,5	52		35,5						42																				
ITA0000066401						74,5	77	46																																			
ITA000018665							33	61					55,5	29,5	46,5	43,5		115						102				88	177	66	159,5	23											
ITA000006474						129	88	62	50	19,5	74	84,5	51,5	66	29,5		20,5	29						60	126	63																	
ITA000024693						114	160	159	126,5	137,5	48,5	99,5	79	150	105,5		78		109	49		67	38,5	60,5				38	145														
ITA000006526						49	83	38	52		106,5	52,5																															
ITA000006628				73	104	79	95	60,5	56,5	39		52,5											13	15	44		32	26	7,5														
ITA000026070		24	160	61	54		53	33	46	58	40	62	37	21	24		17	180	60,5	83	48	21	35	44					15	36		28	52		87								
ITA000006649									40,5	26	38		69	64	40,5								30,5	31	39																		
ITA000006692			153		79	67,5	69,5	72		46,5	55	60	65	99	64		46	33,5		26,5		67	57	50		70	75	96	24	32	47	35	40	30		61	31,5	47,5					
ITA000006462									32	23	18,5	23												12	25	43																	
ITA000019042									20		40	50	41	61	38		19	9				50	40	37					11	48	27	21	26		10		30						
ITA000006465									40		33	4	44	104	36		10																										
ITA000006671							71,5				105,5	98	51,5	135	70		61																										
ITA000006657			156,5	108,5	33	117	69	29,5	67	27	46	41	20	83		22	47	67	10		78	93	220					38	95	118,5	15	94,5	17	35		44							
ITA000018551						66	99	86																																			
ITA000006542				102	97										13																												
ITA000025313												49								6				18	16																		
ITA000006696				40	65	20	86,5	32	26	26	25		15	43	32		24	8		6			30,5			25	90	102,5	10	24	28	11	15	18									
ITA000023241						24		64,5	40	16	24	24	17	68	40		17						68	40	51																		

Kg/ day/vessel average campaign 2020 = 58,2

Table 32 - Transparent goby fishery's bycatch from 2018 experimental campaign.

Year 2018 Kg - by catch	APRIL														MAY														
CFR	9	10	11	12	16	17	18	19	23	24	25	26	30	2	7	8	9	10	14	15	16	17	21	22	23	24	28	29	30
ITA000006465		2,6	4,5			2,5	3	4	4	2		3		5,2					5		5	4,5	4	2,5					
ITA000006474				3	2	2	2		2	2		2	1,5	2	3	3	2,5	2	2,5	4	3	3,5	4	4		1	1		2,5
ITA000006503	2							2												2,5								1,5	
ITA000006529		2	4,5	3		3	2	2	2	2		2,5		3	3	3		7,5		3	1,5								
ITA000006566	2,6	2,5	3,6		2	2	2	2	1	1		1,5	1,5	1,2	1,3	1	1	0,5	1	0,5	0,5	1	0,5	1,5					
ITA000006684		2,5	2,8	1	1	2	1,5			1		2	1,5	3	1	1,4	2,6		1,5		1		1,4	1					
ITA000006688		3			2	2	2	1,5		1,5		1	1,5	1	1	1,5	0,5												
ITA000006705	1	5,5	7,5		3	2	3	2	4	3		1,5			1,5	1,3	3	2,5	8		1,5		2	3	1,5			1	
ITA000018665	2	3,5	3	4	2	3	2	2,5	2			3		2,5	3	5	4	5		5	5	3,5	3		3,5	4			
ITA000019425		1,5	3		1,5	1,5			1	1,5		1,6	1,5	1	1	1	1,3	1	2	1,5	1,5	1,5	1,5	1,5					
ITA000024799	1,5		3,5		2	4	3	3	3	2		2	2	3	3	3							1	1	2				
ITA000026070	0,7	2	0,7		2	2	1,7	1,5	2	2		2		3	2,5	2	2		2,5			2	2	1,5					
ITA000016902						3	2	1	2	2		3																	
ITA000006506						1,5	2	1,5	1	1,5			1,5	1	1,5	1	1	0,5	0,5	0,5	0,5	0,5	0,5	1	1		1,5	1	
ITA000006692					3	3	3	3	3	2,5		2,5	3	2,5	3	3	4	7	5	5	5	5	4,5	1,5			6	2	
ITA000006533										1		1,5																	
ITA000006653						4	3	2,5			2																		
ITA000006659										1,5																			
ITA000018117		1,8	3,5	2	2	1,5	3	1,5			2	1	1	2,5	2	2	1	3,4	3		2	1	1,4	1					
ITA000019001		1,5	3,5	2,5	0,5	1																							
ITA000018385	4,5	3,5		6		5	4	6,5	2	5		5	3	2	3,5	4,5	3,5	3,5	3,5		3,5		5	3	4,5			3	
ITA000006642	1,2	2	1,8		3,5	4	3	2	3	3		2																	
ITA000027914					2	3		2		1,5		2	2		1	1					1						1,5		

Table 33 - Transparent goby fishery's bycatch from 2019 experimental campaign

Year 2019 Kg - by catch	MARCH						APRIL								MAY									
CFR	18	19	20	21	25	26	8	10	11	15	17	18	23	25	29	2	8	14	15	16	21	23	29	30
ITA000006465							1		2															
ITA000006474		4,7	5,4		11,5	9					5						2	2,5	4	3	3	3,5	2	4,5
ITA000006503		5	2	3	9	5	1,5	0,9	1	0,9	1,5	0,9												
ITA000006529									2,5	1,5		2,3												
ITA000006566	2,5	2,5	3	2,6	3,5	4	1	1,5	1,5	1	1,3		0,5		0,5									
ITA000006622		0,95	3,4	3,55	6,5	4		1	1,75	0,5		1,5				0,1								
ITA000006627							1,25	1,5	1,25															
ITA000006637							1	1,5	2															
ITA000006649		4,35	6,6	6,5	7,5	8		0,5	1	0,5		1,5		6	0,3	3								
ITA000006657				5	5	1,5	0,25	0,7	1,25	1	1,4	4,5												
ITA000006684							0,3	1,5	3															
ITA000006688							0,3	1	1,55															
ITA000006696					2,5	2	1,25	2	1,5	1,5		1												
ITA000006698							0,65	1,5	1,29															
ITA000006705							1,2	2	2,25							0,7								3
ITA000018665		2,75	4,5	1,9	4	7		1,5	2,1	0,6	1,1	1				3								
ITA000019042							0,75	1,25	2							0,5								
ITA000019055																1			0,2					
ITA000019425			2	2	7	1	1,25	0,7	1,5	1,3	1,7	1,5				1								
ITA000024693							0,75																	
ITA000024799							0,5	3	2,95							0,5								
ITA000025313							1,2	1,5	1,85															
ITA000025471							1,5	2,6	1,5															
ITA000026070		3	4	5	7	9		0,75	3,5			4,5												
ITA000016902							0,43	1,5	1,5															
ITA000007100		0,7	2	4	5	3,6																		
ITA000006506		2,5	3		6,5	2																		
ITA000006562					2																			
ITA000006628		1,2			7																			
ITA000006658					6,5	11																		
ITA000006690		1,6	3,3	3,1	7	2,5																		
ITA000006692					7,5	5																		
ITA000006700		1,8	1,9	4	3	3																		
ITA000006896		2,3	5	3,8	4	1																		

Table 214 - Transparent goby fishery's bycatch from 2020 experimental campaign.

Year 2020 Kg - by catch	JANUARY								FEBRUARY								MARCH								APRIL								MAY							
CFR	7	8	9	14	15	28	29	30	10	11	12	13	17	18	19	20	24	26	2	3	4	5	9	10	11	6	7	8	14	20	27	28	5	6	13	18	19	20		
ITA000006622																																								
ITA000006658																																								
ITA000006690																																								
ITA000006472																																								
ITA000019001																																								
ITA000002471																																								
ITA000006896																																								
ITA000019425																																								
ITA000006566																																								
ITA000006503																																								
ITA000019055																																								
ITA000002898																																								
ITA000006700	5,5	6,65	8																																					
ITA000006620						2	3	0,9	0,88		1,7		1,4	2	0,72	0,83	1,6	0,4																						
ITA000027914																																								
ITA000006529								2				1,7	1,5	2,35	1							1,85	1,5						1,3	1	2									
ITA000006684						1,5	3	2,4		1,3	2,2	1,9	1,3	1,55	2																									
ITA000006464				5,5	3			1,6			1,5	2,4	1,65	2,5	2,6		1						2																	
ITA0000066401																																								
ITA000018665							1,5	1,5				2	1,5	2	2		3																1							
ITA000006474						2	1,5	2		1	2	2,5	2,7	2	2		1	1,5																						
ITA000024693						2	1,5	1,5	2	2,5	1	2,5	1	3	2		2		1,5	1		2	1																	
ITA000006526							2	1	1,5		2,5	1																												
ITA000006628						2	2,5	2	1	2		2											0,6	0,7	1		1,6	1,3	0,25											
ITA000026070		1	3				1,5	1	2	2	2	2		1			3		2,5	2,5	1		2																	
ITA000006649									2	1	1,9		3,6	3								1,6																		
ITA000006692						2	1,3	1		1	2	2	2	5	2		2	1		1		2		1,5		3	1	3	1,2	2,25				2	1,5	2				
ITA000006462									1	1	0,9	1											0,6	1,3																
ITA000019042									0,5		1	1,5	1	1,5	1		0,75	0,35				1	1,75	1,5										0,5						
ITA000006465									1,5		1	0,2	0,8	2	0,5		0,5																							
ITA000006671								2			2,25	1,5	2,5	3	1,5		2																							
ITA000006657				3	1,75	1,1	2	1	1,48	1,15	1	1,5	1,5	0,75	2		0,5												1,9	2,5			3	0,8	1,8					
ITA000018551																																								
ITA000006542				3	3										0,5																									
ITA000025313												1,5								0,3			0,9	0,8				0,5	2	1	0,6									
ITA000006696						0,5	1	1	1,3	1,3	1		0,5	2	1		1	0,4		0,3		1				1,3	3		3		1,4	0,5								
ITA000023241						1		2	2	0,8	1	1	0,5	1,6	1		0,8					1,5	1,3	1,5																

The difference in average yields recorded between the first and the second season is in line with normal annual variations in natural stock abundance and the variables typical of fisheries.

Considering that, in any case, the fishing season is especially brief. Although the theoretical start is set for November the 1st, the resource approaches the coastal areas and brings numerous individuals into a small space from around March onwards.

Since we are dealing with biological phenomena and migrations within complex interactions between many variables of population dynamics, even though a certain cyclicity can be anticipated, they do not always repeat themselves in the same way. Each year, due to climatic peculiarities that occur from time to time, the phenomena may be more or less pronounced and may undergo seasonal variations, even important ones.

The fact remains that in such a brief fishing season, restrictions on the number of vessels per day, days of the week, fishing hours, gear size and above all fishing yields mean that the resource is in good shape, which can also be seen from the trend in yields, which show no long-term weaknesses.

The following histogram (Fig. 41) shows the obtained size-frequency distribution of the samples found during the experimental campaign in 2020. The graph shows the presence of at least two demographic components: the first one assigned to a modal length class of 25mm total length, the second 34mm total length. These data demonstrate that the transparent goby population in the Gulf of Manfredonia is well structured, with both adult and young specimens (size <30mm LT).

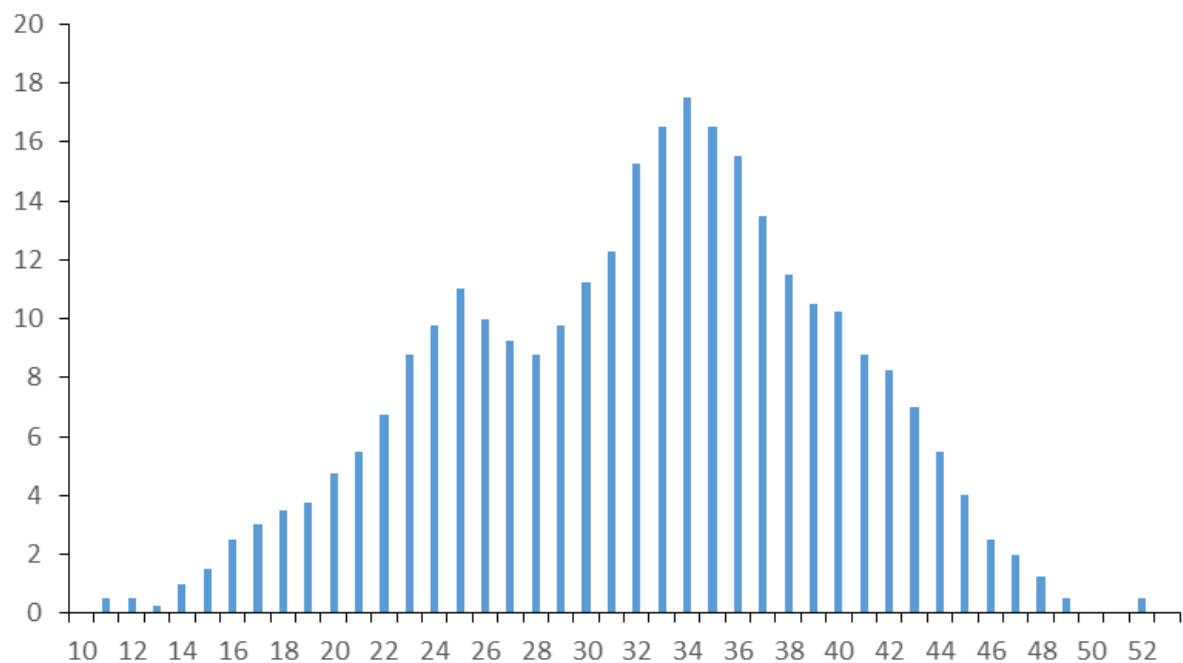


Figure 41 - *Aphia minuta* size-frequency distribution in the Gulf of Manfredonia - 2020

The life cycle of this Gobiidae is short, as seen in paragraph 2.4 usually about one year ending soon after reproduction takes place. This is associated with rapid gonad maturation. The resource is, therefore, able to maintain constant biomass values and shows no signs of suffering from the fishing pressure on it.

4.9 Experimental campaigns 2022, 2022-2023, 2023-2024

Three fishing campaigns have been conducted during the specified period. The first one, for organizational and administrative reasons, started not before the 2022 February 14th and finished the 2022 May 18th.

The second one has been started the 2022, December the 5th and finished the 2023, May the 24th.

The third one has been started the 2023, November the 13rd and finished the 2024, May the 20th.

Tables 35 – 36 and 37 report the daily yield per vessel.

The total catches in the three campaigns (2022, 2022-2023 and 2023-2024) have been respectively Kg 21.754, 53.216 and 45.515. The daily average per vessel in the in the three campaigns has been respectively Kg 44,4; 105,6 and 87,5.

The reported values show that, beyond the normal fluctuations, the catches of transparent goby and its abundance in Manfredonia's Gulf, have not negative impact by the fishing activity conducted.

Indeed, it is confirmed that the biological characteristics of the species (short life cycle, semelparous reproduction) together with a careful and regulated fishery management, allows the commercial exploitation, without endanger its survival.

During the three campaigns, the daily yield per vessel has been constantly monitored, to check if it went under the established Limit Reference Point (LRP) at 35Kg/day/vessel.

Although has been recorded, in some days, a value under the LRP, never have been happened the conditions that would have been make automatically adopt the forecasted measures.

The under thresholds values never have been recorded three consecutive days in the same fishing week or four days during two consecutive weeks.

Sometimes the days in which the values under the LRP have been recorded, are also characterized by few operating vessels. It means that few fishermen made the tentative

even if the conditions were not optimal. There is no relation between the scarce yields and the possible stock depletion.

Tab 35. Transparent goby catches (Kg) campaign 2022

	FEB							MAR											
vessel/UENumber	14	15	16	17	21	23	28	1	2	3	16	17	21	22	23	24	28	29	30
EURO / 25471	139	136	108,5	66,5	42,12														
MATTEO GUERRA/ 6692											58,5	48,6	58,5	49	57,15	54,9			
COSIMO VENTURO / 23241					54														
ADRIATICA II / 6696													53,1	56	77,4	70,2	125,55	103,05	100,35
TEN. COL. FATONE /18553	29,5	18,5	38,43	27,5							93,6	110,9	13,5	18,9	10,8	13,5			
MARIA TERESA / 6474	70	152,8	43,5	31,8	12,15		4	192,5	185,8	151,65	79,7	63,95					58,05	167,76	147,4
LA NOSTRA ANGELA / 18665	32	23,5	14,5	18							97,65		6,75		11,7	10,4	30,6	25,65	18,9
ANGELO AZZURRO / 6683													12,15	20,7		13	48,15	64,8	17
MARIA GRAZIA II / 6465	80,5	52,5	99	49										31,5	32,4	34,65	70,2	99,45	45,45
DOMENICO E ANTONIO II / 2910											97,2	65,35	14,4	22,8	18	18	36	38,25	20,7
PAPA' FRANCESCO SAVERIO / 24693	58,5	38,5	15,5	21	16,2		204,4	39,6	25,2	40,5			17,55	118	19,8	19	34,2	24,3	65,7
MAMMA RAFFAELLA /18245																			
MARTINA E SAVERIO / 6690	105,5	91,5	126	118,6							95,6	72,9	59,85	34,5	59,4	57,6	69,3	28,8	37,35
LUCIA II / 6896	76	33,8	20,5	22,5	59,7	31,05	184,2	44	79,2	71,9			15,6	24,8	18,9	20,7	25,65	44,2	29,55
ANTONIO MATTEO / 19042													17,6	22,7	26,1				
ANGELA E LORENZO / 29866	30	19	16	21,5	26,55														
MICHELA E GIOVANNI / 26799											34,2	6,3							
LA NUOVA MICHELINA / 6657	85	40,5	77	35,5	42,3						45,2	47,7	36,45	77,3	28,8	34,6	35,1	29,7	32,85
NUOVA STELLA II / 6671	22,5	14	13	13,95							29,7	36,5							
RAFFAELE FIGLIO / 18551	23	11	44	91,8	42,3														
SIPONTINA / 6549											13,95								
ELISA MADRE / 6698													23	11,3	21,15	17,1			
RAFFAELLA E FRANCESCO / 6542	21,5	42																	
MATTEO CONOSCITORE / 18117	27,5	26,5																	
N. MARIA ANTONIETTA / 18848	30				13,5								12,6	26,6	19,8	20,3	26,1	46,75	16,65
PASQUALE E SIPONTINA / 25313	32,5	30	15,5	24,5	16,2														
NUOVO S. ANTONIO I / 6462	43,5	30	31,5	31,9	19,8	9,9				20,7			14,4	18	27	50,4	54,9	20,7	16,2
NICOLAO / 6472	25	23,3	20,5	24,5	27,9												16,2		
ISABELLA C. / 6688	57,5	61,5		15,3															
ROSA E ANTONIO / 6628	51	39,5	34	42,3	9,9		33,5	27	22,5	40,5			13,5	16,2	14,4	14,4	23,4	22,5	23,85
AMERIGO VESPUCCI II / 6627					17,1								29,7	26,6	27,9	27,5	45	30,15	30,6
N.MICHELE LUIGI / 24799	30	24,5	21	23,4	23,4								18	43,65		34			
APOLLO 12 / 6446	43	15		22,5	17,55														
LA BELLA MARA / 6533	66	41	58,5	52	21,6														
EMANUELE PADRE / 6684																			
N. VINCENZO ANTONIETTA / 27914	230	56	50,5	71,9	14,85												39,6	32,4	67,05
ANNA E CATERINA / 6503	76,8	22,5	16	16,5															
ANTONIO / 6566	56	52,5	45	28	24,75								26,1	33,3	28,8	19,8	55,8	38,7	29,7
MAMMA SORANO / 19055	34,5	58,5	36,5	46,35															
SONIA E ANGELA / 7100	58,5	83,5	70,5	48,8	19,5	10,8		173,3	149,4	117,9									
LIBERO / 6529											23,85	144,7		21,5		11,7	58,7	64,8	27,9
ANNA E CONCETTA / 6700	34,5	40	8	8															

	APR												MAY									
vessel/UENumber	4	5	6	7	11	12	13	14	19	20	26	27	2	3	4	5	9	11	16	17	18	
EURO / 25471	30,15	34,65	40,5	63																		
MATTEO GUERRA/ 6692						54	54	36	22,05													
COSIMO VENTURO / 23241																						
ADRIATICA II / 6696	49,5	54,9	64,35						25,2													
TEN. COL. FATONE /18553	36,9	27,9	106,45			49,6	38,7	36,45														
MARIA TERESA / 6474																						
LA NOSTRA ANGELA / 18665	96,55	20,25	79,8	35,1		91	19,5	20,7			62,1	42		117,45								
ANGELO AZZURRO / 6683																						
MARIA GRAZIA II / 6465	58,05	51,75	52,65			63,75	48,15	48,6			33,5		46,35	32,4								
DOMENICO E ANTONIO II / 2910	16,2	18	23,4	57	39,6	76,95	31,08	24,3	22,5	18,91	145	25	26,1	22,5	34,65		47,13	68,91	50	50	30	
PAPA' FRANCESCO SAVERIO / 24693	22,95	23,4	34,2			103	29,7	23,76	28,8	15,75	14,85	18,5	53,1									
MAMMA RAFFAELLA /18245									11,25	27,9	12,6											
MARTINA E SAVERIO / 6690	12,15	20,25	21,15	107,55		137,05	94,85	88,9	11,25	11,7	64	54,5	71,1	62,1		46,8						
LUCIA II / 6896	22,95	27,9	30,15	95,4					14,85	20,7									50	55		
ANTONIO MATTEO / 19042									12,5	18	16,2											
ANGELA E LORENZO / 29866																						
MICHELA E GIOVANNI / 26799																						
LA NUOVA MICHELINA / 6657	36	31,5	35,5			55	29,7	28,8	13,5	20,7	17,1	26	22,5	20,7		18,9	18,45	22,05	69,3			
NUOVA STELLA II / 6671																						
RAFFAELE FIGLIO / 18551						200	80					23,85	63				63		63,5			
SIPONTINA / 6549																						
ELISA MADRE / 6698																						
RAFFAELLA E FRANCESCO / 6542																						
MATTEO CONOSCITORE / 18117																						
N. MARIA ANTONIETTA / 18848																						
PASQUALE E SIPONTINA / 25313																						
NUOVO S. ANTONIO I / 6462																						
NICOLAO / 6472																						
ISABELLA C. / 6688																						
ROSA E ANTONIO / 6628	36,9		19,8		58,5	52,5	23,85	18,63			21,6		54,9	13,5		5,85						
AMERIGO VESPUCCI II / 6627	31,5	20,25	69,94	30,6	46,35	50,4	52,65	57,6		37,35	34,2		45			30			70	58		
N.MICHELE LUIGI / 24799	26,1	26,55	22,05			40,5	19,8	21,6		14,85	15,3		39,87	36,45		38,25	92,85	42,3				
APOLLO 12 / 6446																						
LA BELLA MARA / 6533																						
EMANUELE PADRE / 6684											10,8											
N. VINCENZO ANTONIETTA / 27914	22,32	26,1	22,5	27,9		40	30,15	29,25		14,4	13,95								28	11,5		
ANNA E CATERINA / 6503																						
ANTONIO / 6566	31,5	26,1	36,5	36,9	112,5	48,15	29,7	34,2	18	22,5												
MAMMA SORANO / 19055																						
SONIA E ANGELA / 7100	22,05	25,65	24,75	24,3		157	42,25	45,9				68										
LIBERO / 6529	37,35	112,1	138,35			124,4	75,6	19,8				42,5	181,9	108,9		26,55						
ANNA E CONCETTA / 6700																						

Tab 36. Transparent goby catches (Kg) campaign 2022-2023.

	Dec-22															Jan-23														
vessel/UENumber	5	6	7	12	13	14	15	19	20	21	22	27	28	29	2	3	4	5	9	11	12	16	17	18	19	23	24	25	30	31
ECLISSE / 6700																		270,0			120,0									
EURO / 25471																											13,0	40,0	7,0	200,0
MATTEO GUERRA/ 6692																														
COSIMO VENTURO / 23241																														
ADRIATICA II / 6696																					158,0	56,0								
TEN. COL. FATONE /18553																														
MARIA TERESA / 6474																84,6	199,0				180,3	175,6	139,5	222,5	232,7	214,4	227,0	250,0	200,0	
LA NOSTRA ANGELA / 18665																					128,8					200,0	24,8			
ANGELO AZZURRO / 6683																														
PAPA' FRANCESCO SAVERIO / 24693																														
DOMENICO E ANTONIO II / 2910								93,6	195,3	45,0		60,3	70,0	117,0	71,1	163,8			130,0	25,2	125,1	35,0			10,8		123,5	230,8	100,0	
MAMMA RAFFAELLA /18245																														
PICCOLA ANTONELLA /6658																														
MARTINA E SAVERIO / 6690				140,9	36,0	81,5	41,9	161,1	252,9	84,6									198,5								170,0		27,0	
SONIA E ANGELA / 7100																					109,0						17,0			
ANTONIO / 6566															204,0				115,0		120,0	24,3		6,0					180,0	190,0
LUCIA II / 6896																					37,4					67,5	36,9	35,1	153,8	
ANGELA E LORENZO / 29866						17,1						101,7			82,0	50,0			80,0		60,0	105,0		5,0			10,0	177,0	55,0	
MICHELA E GIOVANNI / 26799																														
LA NUOVA MICHELINA / 6657										86,4	31,0	36,0	55,0			162,0	110,0		50,0		72,0	11,0		13,0			38,0	177,0	95,0	
NUOVA STELLA II / 6671																														
LUCIA MARIA / 6479																														
RAFFAELE FIGLIO / 18551																											35,1			170,0
SIPONTINA / 6549																														
ELISA MADRE / 6698																														
RAFFAELLA E FRANCESCO / 6542																														
MATTEO CONOSCIATORE / 18117																														
N. MARIA ANTONIETTA / 18848																					111,2	21,0	16,0				44,0	72,0	110,0	
PASQUALE E SIPONTINA / 25313																														
SHARON / 6526																														
NUOVO S. ANTONIO I / 6462																														
NICOLAO / 6472				60,8	56,7	61,7	62,6	205,2	32,9	40,5					27,7	56,7		73,0	263,7	41,9	125,6									
NUOVA AURORA / 6475	7,0	10,5	99,0	73,7	32,9	95,9		20,7	52,2	111,2	35,1	42,3	211,5			37,8	45,0										81,5	53,6		
ISABELLA C. / 6688																														
PAPA' LUIGI / 29556																														
NUOVA STELLA / 6515																														
ROSA E ANTONIO / 6628																		96,0	78,3	66,2	80,1	136,4		161,9	163,0	33,3	64,8			
AMERIGO VESPUCCI II / 6627								37,0	65,0	45,0		24,5			220,5	203,0		118,8		94,0									80,0	95,0
PICCOLO MASSIMO / 6506																														
N.MICHELE LUIGI / 24799																		45,0			46,0								113,9	201,0
LE SEI SORELLE / 6424																														
APOLLO 12 / 6446				43,2	54,0		25,8		32,9	90,0	128,1	160,7	92,7		94,5	146,0			189,1		185,0	62,10	38,7	14,4	30,2		20,7	20,7	4,5	
NUOVA SIPONTO I / 19001																														
FRANCESCA / 6464																														
LA BELLA MARA / 6533				63,9	111,6		29,2	77,2	52,2	91,0					50,0	210,0		80,0												
EMANUELE PADRE / 6684																														
MARIA GRAZIA II / 6465																														
MARIA ANTONIA / 6620																														
MICHELANGELO / 6562																														
N. VINCENZO ANTONIETTA / 27914												153,9						28,0			80,0	10,0					7,0	59,0	36,0	
ANNA E CATERINA / 6503																														
MAMMA SORANO / 19055	39,0			87,3	163,8	52,2	6,3																							
NELLA MADRE / 28063																														
ADDOLORATA / 19425																														
ANTONIO MATTEO / 19042								49,5	41,0								57,6		227,8											
EMANUELE / 6537								26,1	27,0	52,7		17,1				85,5					37,4									
NUOVA STELLA MARIS II / 6660																														
LIBERO / 6529		33,0	55,0			16,2	59,0	168,8		43,2		30,6	264,6																	
SANT'ANTONIO DA PAD. / 18803																														
ANNA E CONCETTA / 6700																														

	FEB												MAR													
vessel/UEnumber	1	2	13	14	15	16	20	21	22	23	27	28	1	2	6	7	8	9	13	14	20	21	22	23	29	30
ECLISSE / 6700																										
EURO / 25471							135,0	125,0	95,0	110,0			85,0	140,0												
MATTEO GUERRA/ 6692	200,0		200,0	90,0	100,0	150,0									120,0	110,0	100,0	100,0								
COSIMO VENTURO / 23241																										
ADRIATICA II / 6696							69,3	132,6	122,0	84,0	55,0	54,0	57,0	209,0	159,0	102,0	160,0	113,0								
TEN. COL. FATONE /18553																										
MARIA TERESA / 6474	269,6		259,4			198,8	100,0	172,9	27,9	154,0	103,0															
LA NOSTRA ANGELA / 18665			297,2	174,3	22,5	219,8			257,9	29,7	17,0	64,0	47,0	27,0	27,5	262,8	229,7	150,0	277,0	209,0	30,0	389,0	334,0	382,0	449,0	412,6
ANGELO AZZURRO / 6683																										
PAPA' FRANCESCO SAVERIO / 24693																										
DOMENICO E ANTONIO II / 2910	150,0					100,0			100,0	150,0		140,0	140,0	50,0	100,0	182,0	84,0	112,0			208,0	289,0	353,0	426,0	45,0	477,0
MAMMA RAFFAELLA /18245						21,0	23,0																			
PICCOLA ANTONELLA /6658																										
MARTINA E SAVERIO / 6690			278,1		183,6	44,1	12,6	25,2	40,5	69,3	22,0	37,0	51,0	65,0	27,0	33,8	49,3		254,0	204,0						
SONIA E ANGELA / 7100			31,1	29,7	29,0																					
ANTONIO / 6566	313,0		47,7	236,7	120,0	170,0	60,0	85,0	75,0	80,0	91,0	94,0	91,0	65,0	92,0	2,0	173,0	79,0	195,0	131,0						
LUCIA II / 6896	159,7		180,9				17,1	24,3	20,7	38,7																
ANGELA E LORENZO / 29866	87,0																									
MICHELA E GIOVANNI / 26799																										
LA NUOVA MICHELINA / 6657	75,0		27,0	27,0	38,0	44,0	24,0	23,0	36,0	50,0	18,0	25,0	30,0	36,0	35,0	50,0	49,0	43,0	48,0	160,0	50,0	149,0	106,0	40,0		
NUOVA STELLA II / 6671																										
LUCIA MARIA / 6479																										
RAFFAELE FIGLIO / 18551	210,0	350,0			220,0			143,0	50,0	50,0	50,0	50,0		50,0	50,0	50,0	50,0	50,0								
SIPONTINA / 6549																										
ELISA MADRE / 6698																										
RAFFAELLA E FRANCESCO / 6542																										
MATTEO CONOSCITORE / 18117																										
N. MARIA ANTONIETTA / 18848	125,0		77,5	27,5	37,4	28,0	37,0	13,0	38,0	39,0	13,0	25,0	27,0	34,0	46,0	43,0	44,0	30,0	90,0	106,0	70,0	51,0	102,0	70,0		
PASQUALE E SIPONTINA / 25313																										
SHARON / 6526																										
NUOVO S. ANTONIO I / 6462																										
NICOLAO / 6472																										
NUOVA AURORA / 6475	42,3										8,0	3,0		5,0												
ISABELLA C. / 6688																									30,0	190,0
PAPA' LUIGI / 29556																										
NUOVA STELLA / 6515																										
ROSA E ANTONIO / 6628			101,5	37,8	27,0	99,9			54,0																	
AMERIGO VESPUCCI II / 6627	90,0		171,0	36,0	37,0	40,0	6,0	46,0	40,0	40,0		35,0	36,0	40,0	54,0	65,0	56,0	38,0								
PICCOLO MASSIMO / 6506																										
N.MICHELE LUIGI / 24799	210,0		119,9	58,7	120,1	133,6	75,3	99,6	117,4	114,6									68,0	103,0						
LE SEI SORELLE / 6424																										
APOLLO 12 / 6446																										
NUOVA SIPONTO I / 19001																										
FRANCESCA / 6464																										
LA BELLA MARA / 6533																										
EMANUELE PADRE / 6684																										
MARIA GRAZIA II / 6465																										
MARIA ANTONIA / 6620																										
MICHELANGELO / 6562							58,4	36,9	27,9	41,4																
N. VINCENZO ANTONIETTA / 27914											64,0	24,0	56,0	80,0	73,0	85,0	130,1	68,0		116,0	134,0	134,0	139,0			143,7
ANNA E CATERINA / 6503																										
MAMMA SORANO / 19055																										
NELLA MADRE / 28063																										
ADDOLORATA / 19425																										
ANTONIO MATTEO / 19042																										
EMANUELE / 6537																										
NUOVA STELLA MARIS II / 6660																										
LIBERO / 6529	327,9			163,4	38,3	227,9	74,3	266,2			50,0	18,0		78,0	29,7	261,9	273,3		230,0	275,0	322,0	338,0	341,0	375,0		
SAO ANTONIO DA PAD. / 18803																										
ANNA E CONCETTA / 6700																										

	APR													MAY					
vessel/UENumber	3	5	6	11	12	13	17	18	19	20	24	26	27	8	9	10	22	23	24
ECLISSE / 6700																			
EURO / 25471																			
MATTEO GUERRA/ 6692																			
COSIMO VENTURO / 23241																			
ADRIATICA II / 6696																			
TEN. COL. FATONE /18553																			
MARIA TERESA / 6474																			
LA NOSTRA ANGELA / 18665					165,1	361,0		120,1	228,9	255,8				270,0					
ANGELO AZZURRO / 6683																			
PAPA' FRANCESCO SAVERIO / 24693																			
DOMENICO E ANTONIO II / 2910	32,0	30,0	32,0	50,0	350,0	380,0	100,0	280,4	133,3	45,0	378,0	384,4	54,0	173,0	150,0				
MAMMA RAFFAELLA /18245																			
PICCOLA ANTONELLA /6658																			
MARTINA E SAVERIO / 6690																			
SONIA E ANGELA / 7100																			
ANTONIO / 6566																			
LUCIA II / 6896																			
ANGELA E LORENZO / 29866																			
MICHELA E GIOVANNI / 26799																			
LA NUOVA MICHELINA / 6657								131,0	22,0	34,0									
NUOVA STELLA II / 6671																			
LUCIA MARIA / 6479																			
RAFFAELE FIGLIO / 18551																			
SIPONTINA / 6549																			
ELISA MADRE / 6698																			
RAFFAELLA E FRANCESCO / 6542																			
MATTEO CONOSCITORE / 18117																			
N. MARIA ANTONIETTA / 18848																			
PASQUALE E SIPONTINA / 25313																			
SHARON / 6526																			
NUOVO S. ANTONIO I / 6462																			
NICOLAO / 6472																			
NUOVA AURORA / 6475																			
ISABELLA C. / 6688																			
PAPA' LUIGI / 29556																			
NUOVA STELLA / 6515																			
ROSA E ANTONIO / 6628					66,0	92,0		51,6	26,2	76,7									
AMERIGO VESPUCCI II / 6627														156,0	113,0				
PICCOLO MASSIMO / 6506																			
N.MICHELE LUIGI / 24799																			
LE SEI SORELLE / 6424																			
APOLLO 12 / 6446																			
NUOVA SIPONTO I / 19001																			
FRANCESCA / 6464																			
LA BELLA MARA / 6533														250,0	152,0	117,0			
EMANUELE PADRE / 6684																			
MARIA GRAZIA II / 6465																			
MARIA ANTONIA / 6620																			
MICHELANGELO / 6562																			
N. VINCENZO ANTONIETTA / 27914					79,0	112,6		73,2	36,0	52,1			172,8				250,0	76,0	50,0
ANNA E CATERINA / 6503																			
MAMMA SORANO / 19055																			
NELLA MADRE / 28063																			
ADDOLORATA / 19425																			
ANTONIO MATTEO / 19042																			
EMANUELE / 6537																			
NUOVA STELLA MARIS II / 6660																			
LIBERO / 6529					282,8	364,3		61,4	157,0	222,5									
SANT' ANTONIO DA PAD. / 18803																			
ANNA E CONCETTA / 6700																			

Tab 37. Transparent goby catches (Kg) campaign 2023-2024.

	nov-23												Dec-23													
vessel/UENumber	13	14	15	16	20	21	22	23	27	28	29	30	4	5	6	7	11	12	13	14	18	19	20	21	27	28
EURO / 25471																	2	105	55	60						
MATTEO GUERRA/ 6692	180	250,5	219,7	170,1	100	85	100																			
COSIMO VENTURO / 23241																										
ADRIATICA II / 6696					118	75	29																			
TEN. COL. FATONE /18553																										
ANGELO AZZURRO / 6683																										
DOMENICO E ANTONIO II / 2910	60	100	100	100	137	111	40																			
MAMMA RAFFAELLA /18245	278,8	118,9	105	184,2																						
MARTINA E SAVERIO / 6690	233,1	38	40	20,7	109	97	46																			
SONIA E ANGELA / 7100																										
ANTONIO / 6566																										
ANGELA E LORENZO / 29866					100	52	23,8		47		42,3	34,3	45,6	45,3	40,8		32	99,1	31,1	14,3			45		350	96
MICHELA E GIOVANNI / 26799																										
LA NUOVA MICHELINA / 6657					42	54	24																			
NUOVA STELLA II / 6671																										
VINCENZO PADRE / 27135																										
RAFFAELE FIGLIO / 18551																										
SIPONTINA / 6549																										
ELISA MADRE / 6698																										
MATTEO CONOSCITORE / 18117																										
N. MARIA ANTONIETTA / 18848																										
LA FILOMENA																										
PASQUALE E SIPONTINA / 25313																										
MAMMA SORANO / 19055	71,1	27	29,7	31,5																						
NUOVO S. ANTONIO I / 6462																										
NICOLAO / 6472	134,1	138,6	122,4	235,8	86,2	39,8	31,7		56,6		3,3	24,4	108,56	63,6	119,7	40,4	52,7	98,2	125,6	82,3	56,7	90,9	212,5	172	111,43	100,6
NUOVA AURORA / 6475					92,6	22,1	8,2				32	14	30	44,8	53,2	23,7	104	95,9	27,2	18	3,6	42,3	201,1	175,3	242	139,8
ISABELLA C. / 6688																										
ROSA E ANTONIO / 6628		141,9	132,2		125,6	87,7	88,8				45,6	39,6														
AMERIGO VESPUCCI II / 6627																										
PICCOLO MASSIMO / 6506																										
N.MICHELE LUIGI / 24799																										
LE SEI SORELLE / 6424																										
APOLLO 12 / 6446	175,5	44,1	227,7	84,6					31,5		53,9	54,5	48,24	149	79,8	55	40,4	91,1	190,6		57	23,3	238,6	26,7	98,5	126,9
NUOVA SIPONTO I / 19001																										
PAPA' FRANCESCO SAVERIO / 24693																										
MOSE' / 6585																										
LA BELLA MARA / 6533					192,3	188,3	37																			
LUCIA II / 6896					200	150	136,5							40	40	23,5	59,9	24	110	30,8					318,4	55
EMANUELE PADRE / 6684					59,2		20,5																			
MARIA GRAZIA II / 6465																										
MICHELANGELO / 6562	122,85	88,2	51,3	33,3					57,6		48,7	53,9	72,6	10,7	62		54,4	69,8	90	10,1		23	38,9	190,4	156,3	152,3
N. VINCENZO ANTONIETTA / 27914																										
ANNA E CATERINA / 6503																										
NELLA MADRE / 28063																										
ADDOLORATA / 19425																										
ANTONIO MATTEO / 19042																									52,5	43,1
EMANUELE / 6537					53	36,7							25,88	46,6	23,1											
MARIA TERESA / 6474	270	166,5	342,2	126,9	144	73,8	51,5		55,9		95,3	295,6	96	129,5	119,8	65,6	91,2	341,1	238,2	97,3	121,1			261,3	279,6	
SANT'ANTONIO DA PADOVA / 18803																										
PICCOLA ANTONELLA /6658																										
LA NOSTRA ANGELA / 18665					101,9	138,6	21,6						21,5	52	74,4											
LIBERO / 6529	433,2	342,3		229,7	352,4	254,3	235,4		57		258,2	228,7		92,9	84,8		375,2	336,3	127,5	13,7				60,1	211,7	
ANNA E CONCETTA / 6700																										

	Jan-24																	FEB																
vessel/UENumber	2	3	8	9	10	11	15	16	17	18	22	23	24	25	29	30	31	1	5	6	7	8	12	13	14	15	19	20	21	22	26	27	28	29
ECLISSE / 6700																																		
EURO / 25471							105	120	75				105	130	75	55	60	55																
MATTEO GUERRA/ 6692		90																									150	150	130	200	50			
COSIMO VENTURO / 23241																50	50																	
ADRIATICA II / 6696																																		
TEN. COL. FATONE /18553																35	24	24	18															
ANGELO AZZURRO / 6683																																		
DOMENICO E ANTONIO II / 2910			100	100	50	50	40	65	53		60	50	50	20	20	20	20	20					20	10	40					130	60			
MAMMA RAFFAELLA /18245																																		
MARTINA E SAVERIO / 6690											18	21	34	35	25	22	37										91	260	48	130				
SONIA E ANGELA / 7100																																		
ANTONIO / 6566							35	38	60						40	32	41																	
ANGELA E LORENZO / 29866		150					70	13	60																									
MICHELA E GIOVANNI / 26799																											20	21	15	15				
LA NUOVA MICHELINA / 6657							48	45	28							40	27	27	34															
NUOVA STELLA II / 6671																																		
VINCENZO PADRE / 27135											60	60	250	104	50	27	20																	
RAFFAELE FIGLIO / 18551																35	26																	
SIPONTINA / 6549																20	16	15	10															
ELISA MADRE / 6698																25	20	15	25															
MATTEO CONOSCIATORE / 18117							30,4	19			15,3		34,1																					
N. MARIA ANTONIETTA / 18848		8					27	32	25							25	23	27																
LA FILOMENA																13	40	10	10															
PASQUALE E SIPONTINA / 25313																																		
MAMMA SORANO / 19055							20		20		10	10		20	20	20	20	10																
NUOVO S. ANTONIO I / 6462																10	20	10	10				45,3	10	40									
NICOLAO / 6472	169,9	44,8	94,7	49,2	55										100																			
NUOVA AURORA / 6475	121,2	75,3	0,9		10,6						11,3	1,9																						
ISABELLA C. / 6688																																		
ROSA E ANTONIO / 6628			72,7	63,1	70,84	61,7	30,8	59,6	70,4				83,6	75,1													24	261,7	153,9	149				
AMERIGO VESPUCCI II / 6627		66						49	45							40	55	33	35												55	33		
PICCOLO MASSIMO / 6506																																200		
N.MICHELE LUIGI / 24799																27	25	24	30															
LE SEI SORELLE / 6424														8	40	21	38	30	16															
APOLLO 12 / 6446						65,9	61,3	49,6			12,9	6	79,6	38	40	50,5	27																	
NUOVA SIPONTO I / 19001																																		
PAPA' FRANCESCO SAVERIO / 24693		50	100					60								36	40	27	36															
MOSE' / 6585	130,7	114,3					29	82,3	71							37,7	56,4	37,7	40,4															
LA BELLA MARA / 6533				54,5												47	34	32	33															
LUCIA II / 6896		128,2														32	40	40	35															
EMANUELE PADRE / 6684																43	31	23	19															
MARIA GRAZIA II / 6465																																		
MICHELANGELO / 6562							32,7	25,1	67,2	14		74,4	43,9	95,3	57,7	60,2	45,2	50,4																
N. VINCENZO ANTONIETTA / 27914																						4,6					20	400	350	200				
ANNA E CATERINA / 6503																																		
NELLA MADRE / 28063	27,3	28,9	8				20																											
ADDOLORATA / 19425																																		
ANTONIO MATTEO / 19042																80,1	27,1	23,6	24,2															
EMANUELE / 6537																																		
MARIA TERESA / 6474	337,9	58,7	37,4	124,8	81,5		81,2	61,5	75,6				167,9	26,7	179,1	163,5	27,5					20	56	42,75		336								
SANT'ANTONIO DA PADOVA / 18803																40	30	35	20															
PICCOLA ANTONELLA / 6658																																		
LA NOSTRA ANGELA / 18665			11,7				13,8		32,3							37,4	125,5	78,2	74															
LIBERO / 6529			115,55			24,6		204,6	153,2			46,9		143			42,8	124,3	96															
ANNA E CONCETTA / 6700																74	56	59	61															

	MAR																APR															
vesse/UEnumber	4	5	6	7	11	12	13	14	18	19	20	21	25	26	27	28	2	3	4	8	9	10	11	15	16	17	18	22	23	24	29	30
ECLISSE / 6700																																
EURO / 25471																																
MATTEO GUERRA/ 6692																																
COSIMO VENTURO / 23241																																
ADRIATICA II / 6696																																
TEN. COL. FATONE /18553																																
ANGELO AZZURRO / 6683																																
DOMENICO E ANTONIO II / 2910	20		379,6				50	374,1	416,3	351	297	200	160				234,5	240	330				330	50			190	50			50	
MAMMA RAFFAELLA /18245								223	240	364	297	170																				
MARTINA E SAVERIO / 6690																																
SONIA E ANGELA / 7100																																
ANTONIO / 6566																																
ANGELA E LORENZO / 29866																																
MICHELA E GIOVANNI / 26799																																
LA NUOVA MICHELUNA / 6657																																
NUOVA STELLA II / 6671																																
VINCENZO PADRE / 27135																																
RAFFAELE FIGLIO / 18551																																
SIPONTINA / 6549																																
ELISA MADRE / 6698																																
MATTEO CONOSCITORE / 18117																																
N. MARIA ANTONIETTA / 18848																																
LA FILOMENA																																
PASQUALE E SIPONTINA / 25313																																
MAMMA SORANO / 19055																																
NUOVO S. ANTONIO I / 6462																																
NICOLAO / 6472																																
NUOVA AURORA / 6475																																
ISABELLA C. / 6688													100						200													
ROSA E ANTONIO / 6628																																
AMERIGO VESPUCCI II / 6627																																
PICCOLO MASSIMO / 6506																																
N.MICHELE LUIGI / 24799																																
LE SEI SORELLE / 6424																																
APOLLO 12 / 6446																																
NUOVA SIPONTO I / 19001																																
PAPA' FRANCESCO SAVERIO / 24693																																
MOSE' / 6585																																
LA BELLA MARA / 6533																																
LUCIA II / 6896																																
EMANUELE PADRE / 6684																																
MARIA GRAZIA II / 6465																																
MICHELANGELO / 6562																																
N. VINCENZO ANTONIETTA / 27914																			230	400	400	400	200				150	50			150	
ANNA E CATERINA / 6503																																
NELLA MADRE / 28063																																
ADDOLORATA / 19425																																
ANTONIO MATTEO / 19042																																
EMANUELE / 6537																																
MARIA TERESA / 6474																																
SANT'ANTONIO DA PADOVA / 18803																																
PICCOLA ANTONELLA /6658																																
LA NOSTRA ANGELA / 18665																																
LIBERO / 6529																																
ANNA E CONCETTA / 6700																																

	MAY																	
vessel/UEnumber	1	2	6	7	8	9	13	14	15	16	20	21	22	23	27	28	29	30
ECLISSE / 6700																		
EURO / 25471																		
MATTEO GUERRA/ 6692																		
COSIMO VENTURO / 23241																		
ADRIATICA II / 6696																		
TEN. COL. FATONE /18553																		
ANGELO AZZURRO / 6683																		
DOMENICO E ANTONIO II / 2910		40	130	40	50			100										
MAMMA RAFFAELLA /18245																		
MARTINA E SAVERIO / 6690																		
SONIA E ANGELA / 7100																		
ANTONIO / 6566																		
ANGELA E LORENZO / 29866																		
MICHELA E GIOVANNI / 26799																		
LA NUOVA MICHELINA / 6657																		
NUOVA STELLA II / 6671																		
VINCENZO PADRE / 27135																		
RAFFAELE FIGLIO / 18551																		
SIPONTINA / 6549																		
ELISA MADRE / 6698																		
MATTEO CONOSCITORE / 18117																		
N. MARIA ANTONIETTA / 18848																		
LA FILOMENA																		
PASQUALE E SIPONTINA / 25313																		
MAMMA SORANO / 19055																		
NUOVO S. ANTONIO I / 6462																		
NICOLAO / 6472																		
NUOVA AURORA / 6475																		
ISABELLA C. / 6688																		
ROSA E ANTONIO / 6628																		
AMERIGO VESPUCCI II / 6627																		
PICCOLO MASSIMO / 6506																		
N.MICHELE LUIGI / 24799																		
LE SEI SORELLE / 6424																		
APOLLO 12 / 6446																		
NUOVA SIPONTO I / 19001																		
PAPA' FRANCESCO SAVERIO / 24693																		
MOSE' / 6585																		
LA BELLA MARA / 6533																		
LUCIA II / 6896																		
EMANUELE PADRE / 6684																		
MARIA GRAZIA II / 6465																		
MICHELANGELO / 6562																		
N. VINCENZO ANTONIETTA / 27914																		
ANNA E CATERINA / 6503																		
NELLA MADRE / 28063																		
ADDOLORATA / 19425																		
ANTONIO MATTEO / 19042																		
EMANUELE / 6537																		
MARIA TERESA / 6474																		
SANT'ANTONIO DA PADOVA / 18803																		
PICCOLA ANTONELLA /6658																		
LA NOSTRA ANGELA / 18665																		
LIBERO / 6529																		
ANNA E CONCETTA / 6700																		

During the 2022 campaign, considering all the vessels, a total of 490 fishing days have been made, during 40 effective days. The graph in fig 42, that reports only the effective days, shows the average catches per vessel per single day.

The highest catch value, Kg 106.5, has been recorded on 28 February 2022, while the lowest, Kg 17.2, has been recorded on 23 February 2022.

During the 2022-2023 campaign, considering all the vessels, a total of 504 fishing days have been made, during 75 effective days. The graph in fig 43, that reports only the effective days, shows the average catches per vessel per single day.

The highest catch value, Kg 384.4, has been recorded on 26 April 2023, while the lowest, Kg 21.7, has been recorded on 6 December 2022.

During the 2023-2024 campaign, considering all the vessels, a total of 520 fishing days have been made, during 102 effective days. The graph in fig 44, that reports only the effective days, shows the average catches per vessel per single day.

The highest value, Kg 400, has been recorded for three consecutive days starting from 9 April 2024. The three data are related to the same vessel. The lowest value, Kg 10.7, has been recorded on 22 January 2024.

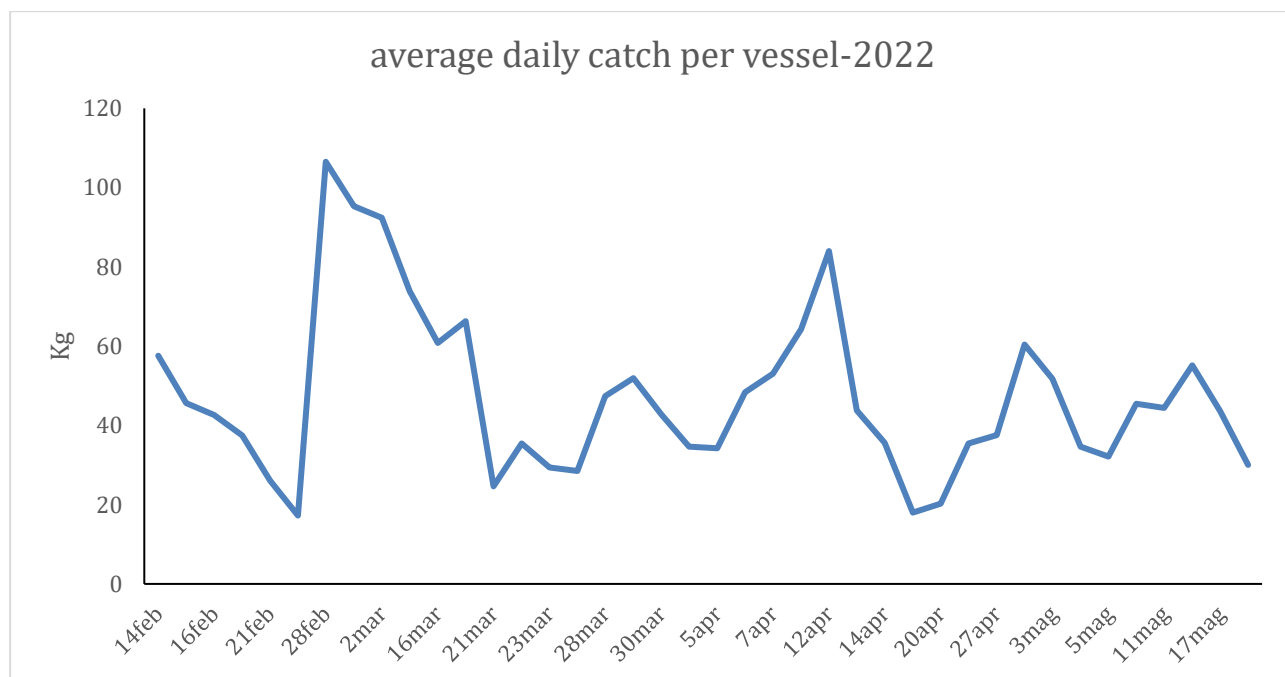


Fig. 42 average daily catch per vessel (Kg) of transparent goby, in the 40 effective fishing days - campaign 2022

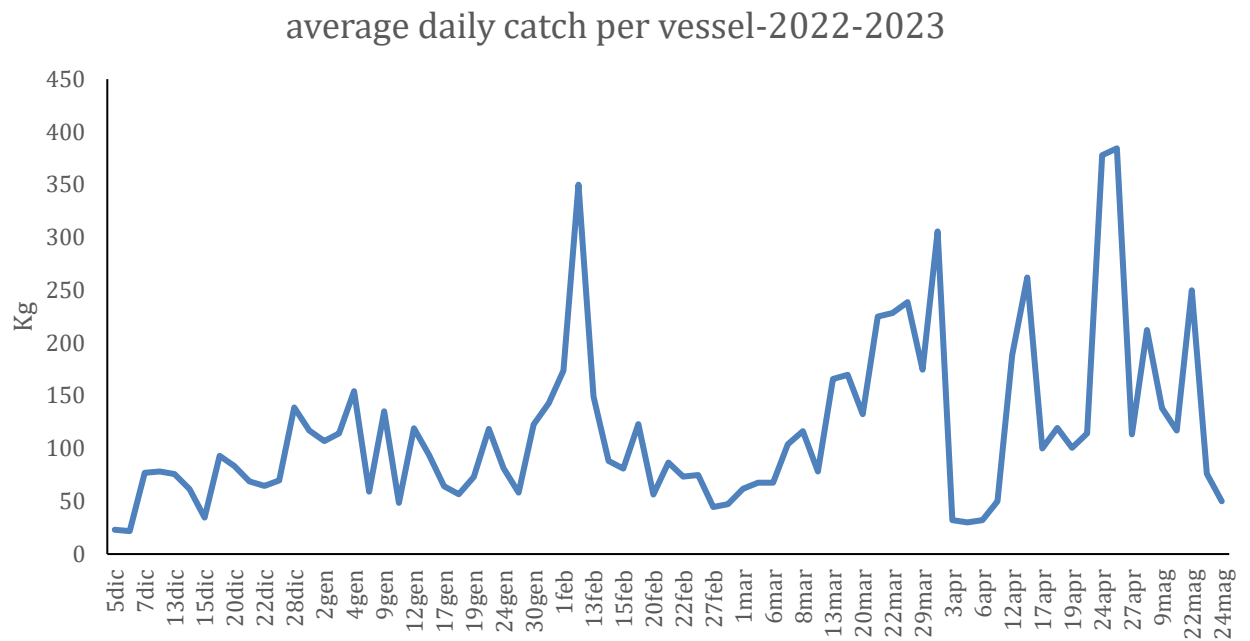


Fig. 43 average daily catch per vessel (Kg) of transparent goby, in the 75 effective fishing days - campaign 2022-2023

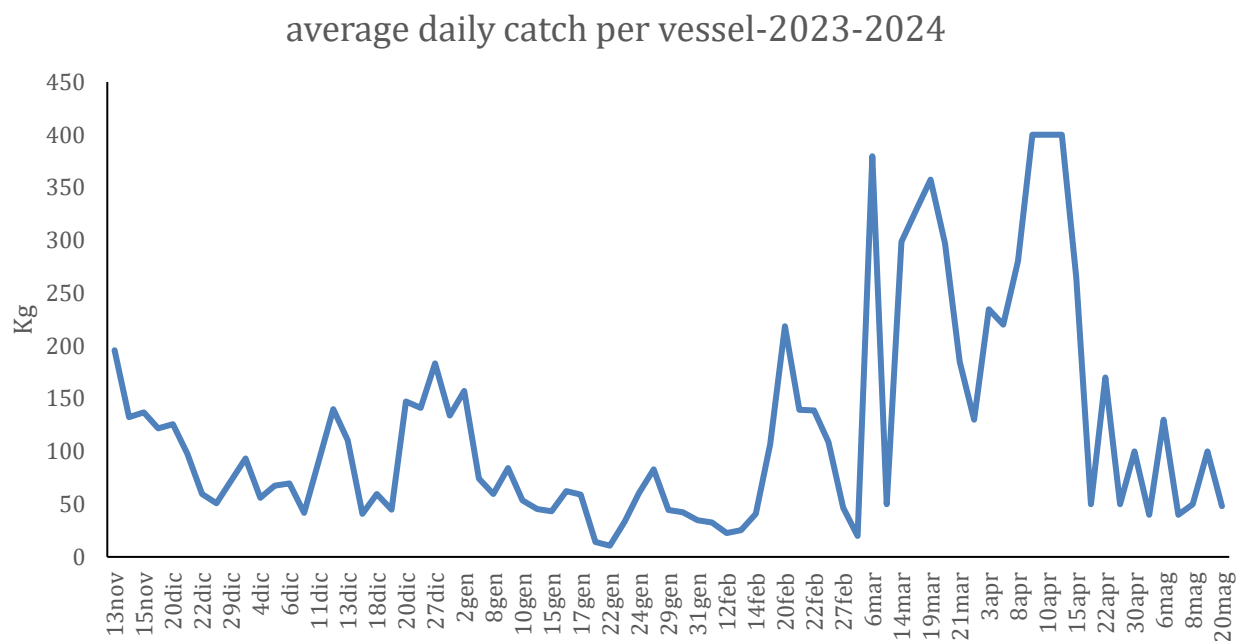


Fig. 44 average daily catch per vessel (Kg) of transparent goby, in the 102 effective fishing days - campaign 2023-2024

The average daily catch per vessel, in the total of the three campaigns, show fluctuations well explained by the characteristics of this fishery. The fishery has

aleatory yields, for reasons linked to the population dynamics of the resource transparent goby, and because the fishing activity are impacted by many factors (weather and sea conditions, physical and chemical water state, atmospheric state, etc) that influence the yields.

Considering the data reported, it can be asserted that the resource is not endangered by the fishing pressure, due that the yield fluctuations are not related to abundance crisis. One of the main population dynamic characteristics of the transparent goby (beyond the short life cycle and the semelparous reproduction), is the habit of concentrating big number of individuals in some areas (Manfredonia Gulf) in certain periods, and then dispersing over a wider area. The yields are also influenced by the variability due to the various phases of this migration, while there is no evidence of a negative trend in abundance.

The possibility of carrying out this fishery is very important for the environment and the resources and for the economy generated.

Regarding the environment and the resources aspects, it must be considered that, at least in the period in which the fishery is carried out, the fishing pressure is reduced on the other commercial resources. These normally do not have the same characteristics of short life cycle and semelparous reproduction and are therefore more vulnerable against the stress due to fishing catches.

By-catch

The share of by-catch on the total catches in the three campaigns is lower than the limit of 10% of the landed product, the share of juveniles is insignificant.

In the 2022 campaign, the 30% of the by catch was made of red mullets, 16% of bogues, 14% of poor cods, 10% of little squids, 7% of mullets, 3% of mackerel, and 20% of other species (Fig. 45a).

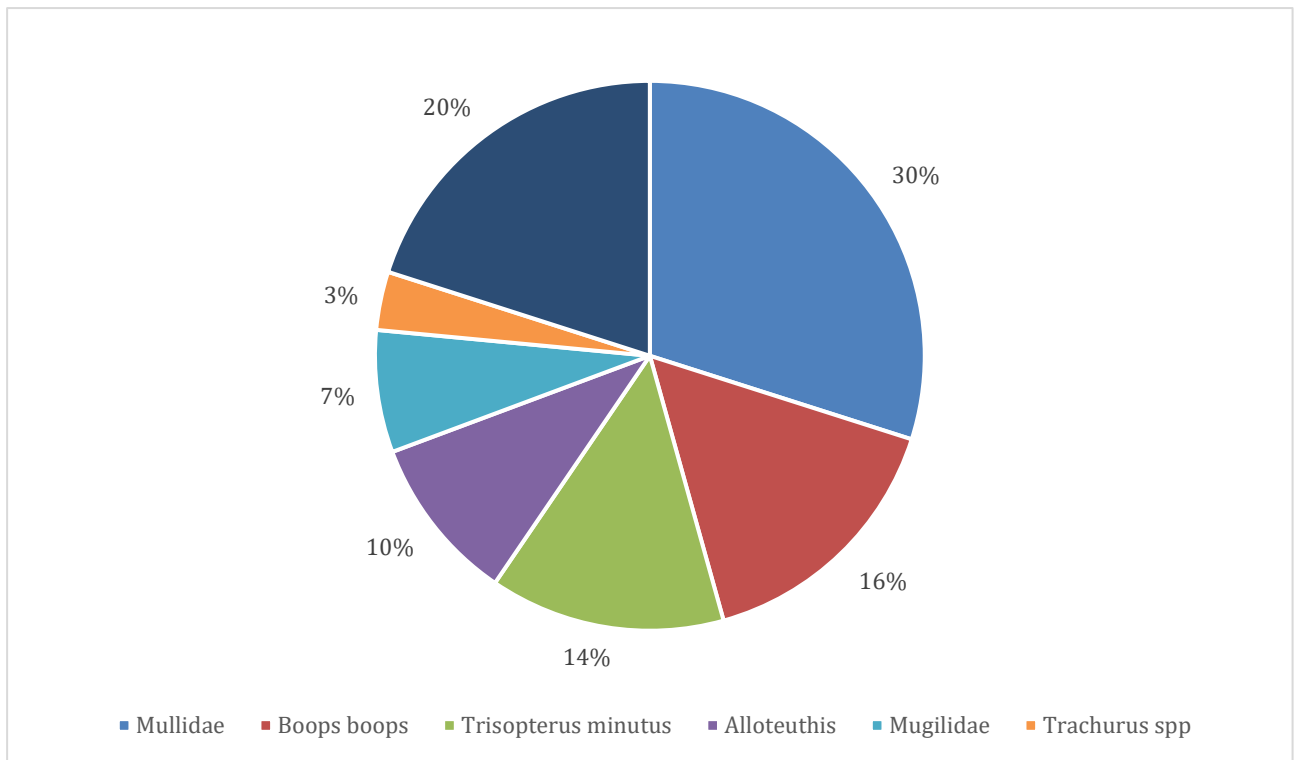


Fig. 45a. By-catch composition campaign 2022

The quantitative ratio between the transparent goby and the by-catch during the campaign 2022 is shown in the following graph (Fig. 45b). The daily catches per species are shown in Appendix 4

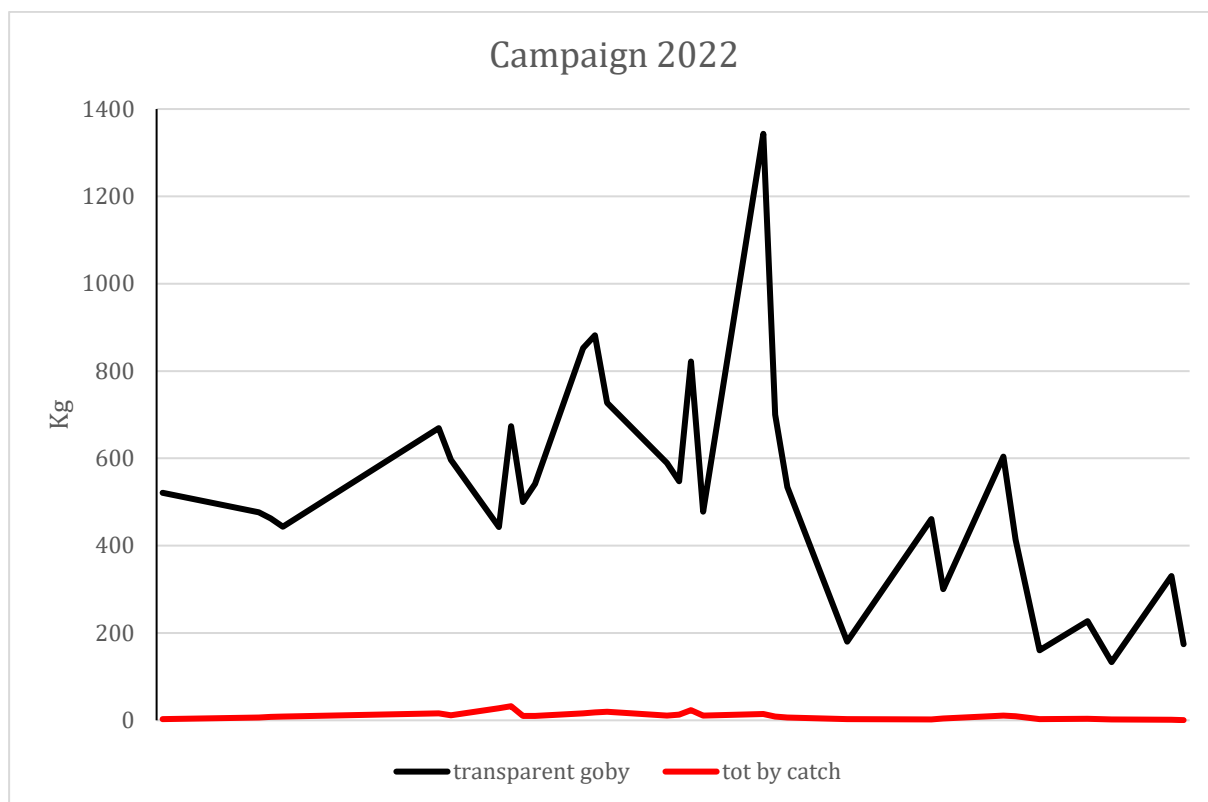


Fig. 45b. Ratio transparent goby / by-catch – campaign 2022

In the 2022-2023 campaign, 28% of the by catch was made of red mullets, 27% of bogues, 3% of poor cods, 7% of little squids, 2% of mullets, 25% of mackerel, and 8% of other species (Fig. 46a).

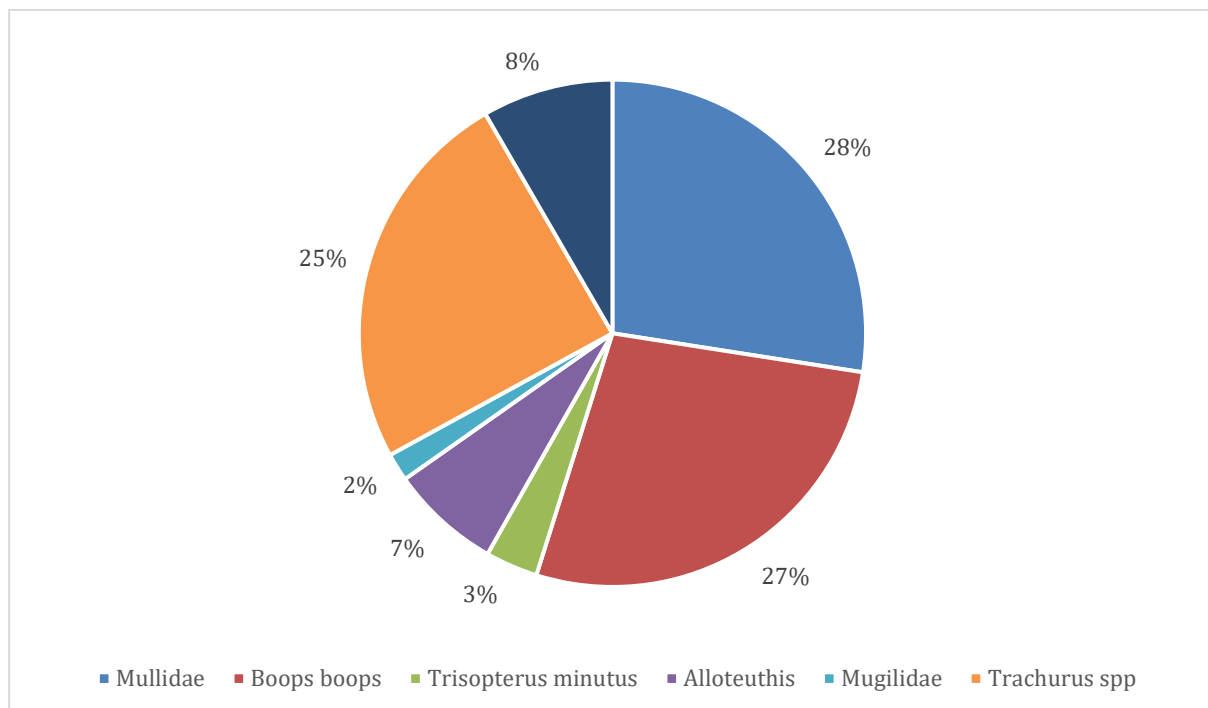


Fig. 46a. By-catch composition campaign 2022-2023

The quantitative ratio between the transparent goby and the by-catch during the campaign 2022 - 2023 is shown in the following graph (Fig. 46b). The daily catches per species are shown in Appendix 5

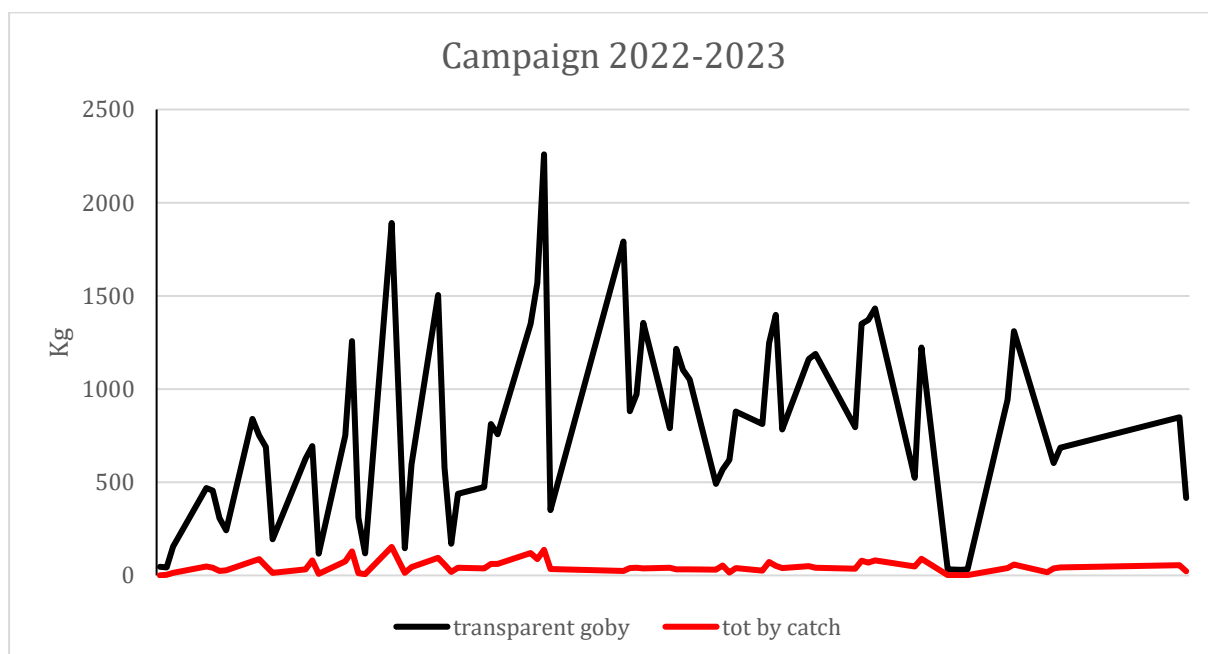


Fig. 46b. Ratio transparent goby / by-catch – campaign 2022 - 2023

In the 2023-2024 campaign, 62% of the by catch was made of red mullets, 4% of bogues, 10% of little squids, 15% of mackerel, and 9% of other species (Fig. 47a).

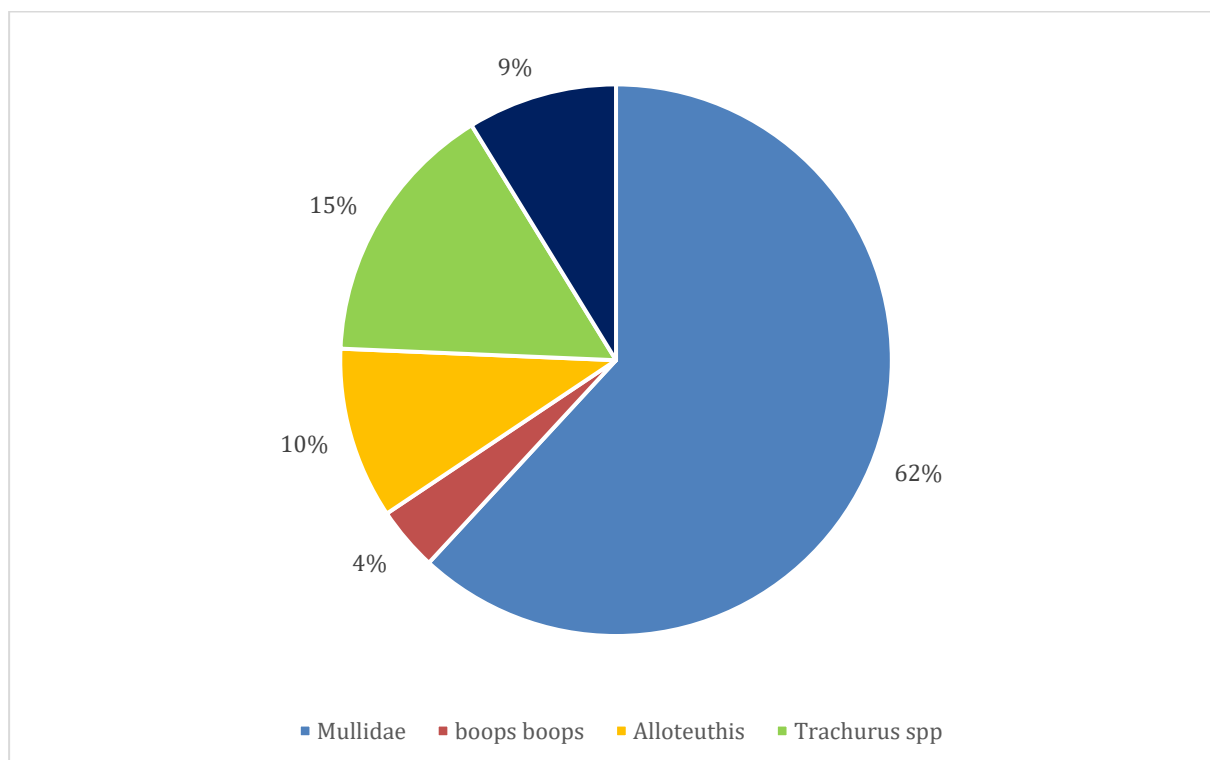


Fig. 47a. By-catch composition campaign 2023-2024

The quantitative ratio between the transparent goby and the by-catch during the campaign 2023 - 2024 is shown in the following graph (Fig. 47b). The daily catches per species are shown in Appendix 6.

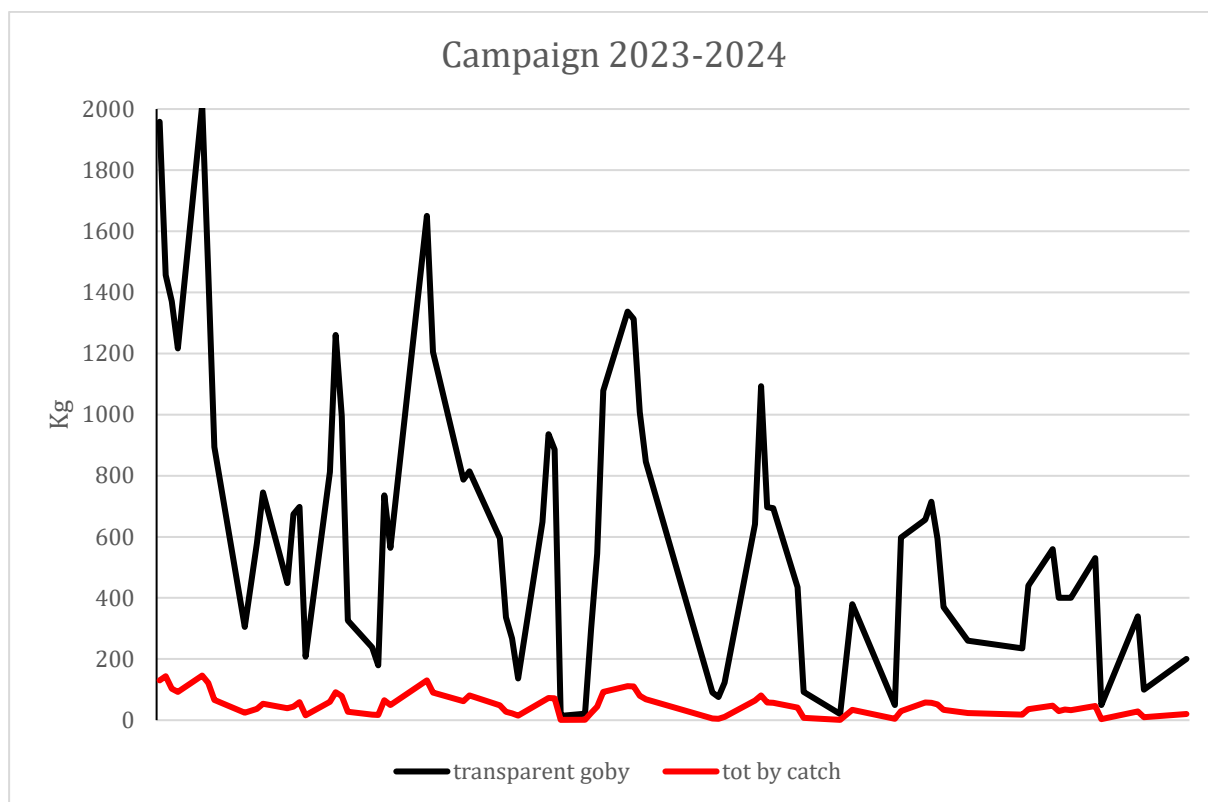


Fig. 47b. Ratio transparent goby / by-catch – campaign 2023 - 2024

In view of a constant improvement in the fishing monitoring, sampling data on size composition principal species, will be collected starting from next fishing campaign, particularly those mentioned in Annex IX of Regulation (EU) 2019/1241.

4.10 Trend analysis last six campaigns

The analysis is based on data collected during the last 6 fishing seasons from 2018 to 2024, covering a six-year period. The data have been divided into annual and monthly periods, allowing detailed comparison of trends and variations. Individual fishing seasons are identified with the calendar year of their conclusion. The graphs and scatterplots used in the analysis provide a visual representation of the relationships and trends observed in the data. The results of the analysis have important implications for fisheries management. The increase in catch and fishing effort in recent years suggests the need to closely monitor the fishery to ensure that it remains sustainable, as the results show that it currently is. The observed variability in daily catch and fishing effort calls for an adaptive approach in resource management, considering changes in environmental conditions and availability of fish resources.

The primary purpose of this analysis is to examine temporal and seasonal trends in fishing catches, analyzing fishing effort and catch efficiency, and their changes over the study period. The analysis focuses on several aspects, which include:

1. **Distribution of Daily Catches:** To observe and analyze how daily catches have varied from year to year and month to month, identifying any significant peaks or troughs.
2. **Cumulative Fishing Effort:** To examine accumulation trends in fishing effort, measured in terms of the number of boats operating each day, to understand the seasonal and interannual dynamics of fishing activity.
3. **Average Daily Catch and Catch per Unit Effort (CPUE):** To evaluate the efficiency of the fishery by examining average daily catch and CPUE, a key indicator for understanding the productivity and impact of the fishery.
4. **Relationship between Effort and Catch:** To explore the correlation between the number of vessels and catch, to assess how increased effort influences total catch.

Activities and catches in 2020 are affected by events related to the COVID-19 pandemic, and yields show a decline. In subsequent years there is a marked recovery,

with 2023 emerging as a particularly productive year with a strong correlation between effort and catch, indicative of very favorable fishing conditions. These may be driven by increased availability of fish resources, and also by good marine weather conditions, which strongly influence the activity. The year 2022, although less productive than 2023, shows an improving trend compared to 2020, with an increase in catch and a recovery in fishing operations (Figs. 49 and 50). Analysis of the effort/catch relationship reveals a positive correlation between the number of vessels and catches (Fig. 52). The year 2023, with the steepest slope, indicates particularly high efficiency, while 2024, although less efficient, still shows good performance. The presence of outliers in each year suggests that there were days with exceptionally high catches, highlighting the intrinsic variability of fishing operations. The distribution of catches by year, represented in the boxplots, shows a general upward trend in median catches from 2018 to 2024 (Fig. 53). The year 2022 shows a median above the 35th percentile of the entire historical series (35.1 kg) but below the overall average (72 kg), suggesting that, despite the difficulties, the efficiency of the fishery is improving. 2023 and 2024 show higher median catches, indicating particularly productive years, with 2024 standing out as having the highest median, suggesting exceptionally favorable fishing conditions. The overall analysis indicates that the fishery has gone through periods of fluctuation, with a significant decline in 2020 due to the pandemic, followed by a strong recovery in subsequent years. Fishing efficiency has improved significantly, with 2023 representing a year of high productivity. However, variability in catches and the presence of outliers indicate that fishing conditions are affected by variable external factors such as environmental conditions.

In 2022, daily catches showed relative stability, suggesting a balance in the fishery. In 2023, greater variability was observed with significant peaks in the winter months. This could indicate a response to environmental conditions or changes in the distribution of species caught. The 2024 showed a consistent increase in catch toward spring, suggesting a potential improvement in fishing conditions or fish population. Analysis of cumulative fishing effort (Fig. 49) revealed a steady increase in early 2022,

followed by more gradual growth. In 2023, effort was initially similar but with a higher peak in the spring. In 2024, effort showed rapid growth in the early months, followed by a stabilization, suggesting an earlier start of fishing activities

By analyzing the supplied graphs, several significant observations and trends are emerging and offer a detailed picture of the status of the resource during 2018-2024. One important observation concerns the seasonal fluctuations noticeable in daily catches. This pattern is consistent each year, suggesting seasonality in the availability of fish resources or environmental conditions affecting the fishery, or in response to market demands. Moreover, 2020, a year marked by the COVID-19 pandemic, showed a significant decline in catch and fishing efficiency. Nevertheless, the following years, especially 2023, exhibited a strong recovery, with a substantial increase in catch and a recovery in fishing activity. In 2023, the CPUE showed a marked correlation between effort and catch, indicating a particularly productive year with favorable conditions. In contrast, 2022 presented an initially low but steadily increasing CPUE, suggesting an improvement in fishing conditions toward spring. The year 2024, although starting with a low CPUE, showed a marked rebound toward the end of the season, indicating a positive trend in fishing operations. The distribution of annual catches, depicted in boxplots (Fig. 53), shows a general upward trend in medians from 2018 to 2024. The years 2023 and 2024 stand out with higher medians and a wider catch distribution, suggesting very favorable fishing conditions.

These observations outline a complex and dynamic snapshot of the state of the fishery. Seasonal fluctuations, the impact of the pandemic, and the subsequent recovery highlight the resilience of the fishery and the need to adapt fishing strategies to environmental and regulatory conditions. Fishing efficiency, as gauged through CPUEs and the relationship between effort and catch, shows positive trends in recent years, with 2023 emerging as a particularly favorable year. Variability in catch and the presence of outliers suggest that despite generally favorable conditions, there are days with exceptional catches that can significantly affect annual averages. Analysis of cumulative daily catch (Fig. 50) and average daily fishing effort (Fig. 51) shows a clear

correlation between the number of vessels engaged in fishing and the total amount of fish caught. In the most recent years (2023 and 2024), there is an increase in the number of active vessels during the first months of the year, accompanied by a significant increase in cumulative catch. CPUE is a critical indicator of fishing efficiency, reflecting the quantity of fish caught per unit effort. In the most recent years, particularly in 2023 and 2024, an increase in CPUE is observed, suggesting that the resource has not been negatively affected by the fishing pressure on it and that the management of the harvest is such that it is sustainable even in the long term, while still complying with the seasonality that characterizes it.

The distribution of catch values (Fig. 48) provides further details on the variability and consistency of daily catches. In recent years, the distribution shows greater variability with some outliers, indicating days with exceptionally high catches. This suggests that although overall efficiency has improved, there are still significant daily fluctuations due to the particular fishery being influenced by multiple variables, including marine weather conditions. Comparing the years 2022-2024 with 2018-2020, there is a clear improvement in fishing metrics. The most recent years show positive feedback to the increased efforts, with a significant improvement in CPUE and greater variability in catch values, suggesting that fishery resources are being exploited efficiently. Although the increase in catch and fishing efficiency is positive from an economic perspective, it is essential to consider the long-term sustainability of fishery resources. The increase in CPUE and cumulative catch indicates that fish populations are currently abundant. It is worth mentioning again that we are dealing with a phenomenon characterized by seasonality. The 'rossetto' cyclically concentrates inshore around the months of November and December, and then recedes in late spring. This phenomenon is repeated every year, with an available total biomass that can be highly variable. It is therefore crucial to continue to closely monitor these metrics and maintain adaptive management practices to ensure that the fishery remains sustainable over the long term.

Analysis of Raw Daily Landings (2018-2024)

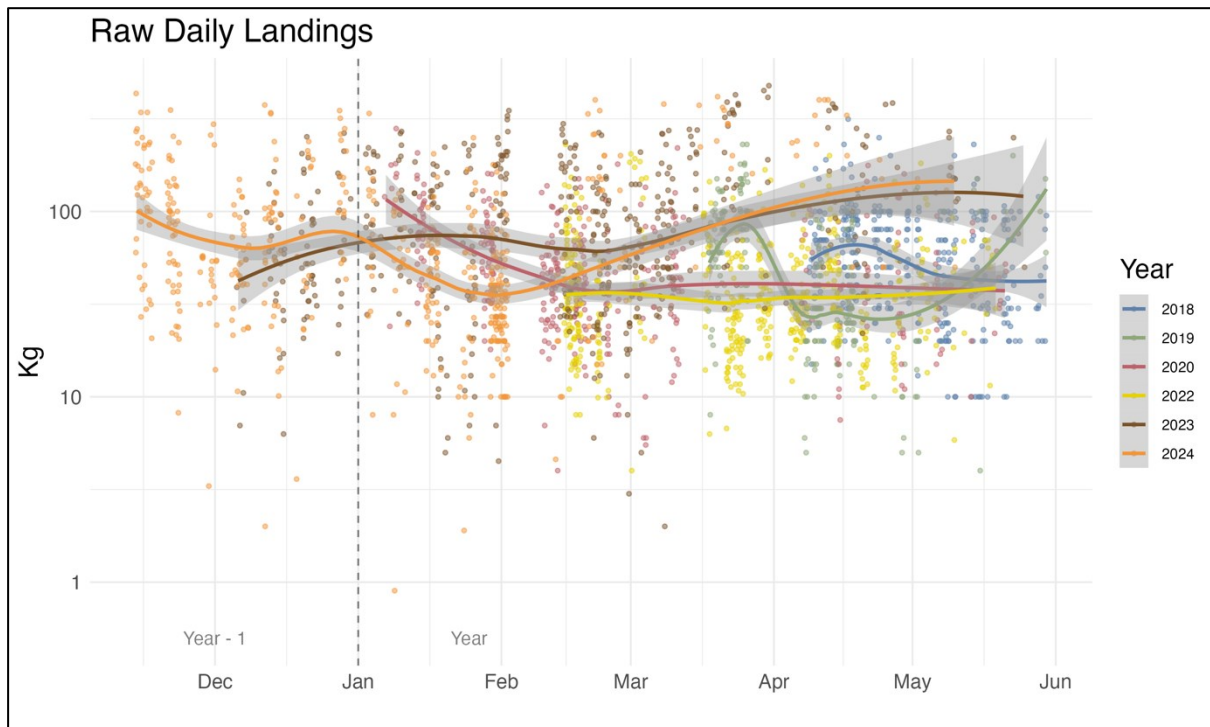


Fig. 48 raw daily catch data form the six fishing seasons related to the last two management plans (n.b. the season is indicated with the year of completion).

Figure 48 shows the Raw Daily Landings in kilograms (Kg), over the six fishing years. Analyzing the 2022 data, there is a relative stability in daily catches compared to previous years. The distribution of catches appears to be fairly uniform. This may indicate a balance in fishing activities and efficient management of fish resources throughout the year. In 2023, the data show greater variability, with a notable peak in the winter months followed by a marked decline in late winter and early spring. This pattern could suggest a response to environmental conditions or changes in the distribution of harvested species. The presence of significant peaks could indicate exceptional events or more pronounced seasonal variations than in previous years. As for 2024, daily catches show an initial trend similar to previous years, with a slight decrease during the last winter months. However, a larger increase in catch is observed toward spring, suggesting a potential improvement in fishing conditions or an increase in the fish population. This could be a positive sign for the sustainability

of the fishery, indicative of fish recovery or more effective resource management. Comparing the three-year period 2022-2024 with the previous period (2018-2020) shows greater variability in daily catches. Previous years show a more regular trend and less prone to fluctuations.

Analysis of cumulative daily effort (2018-2024)

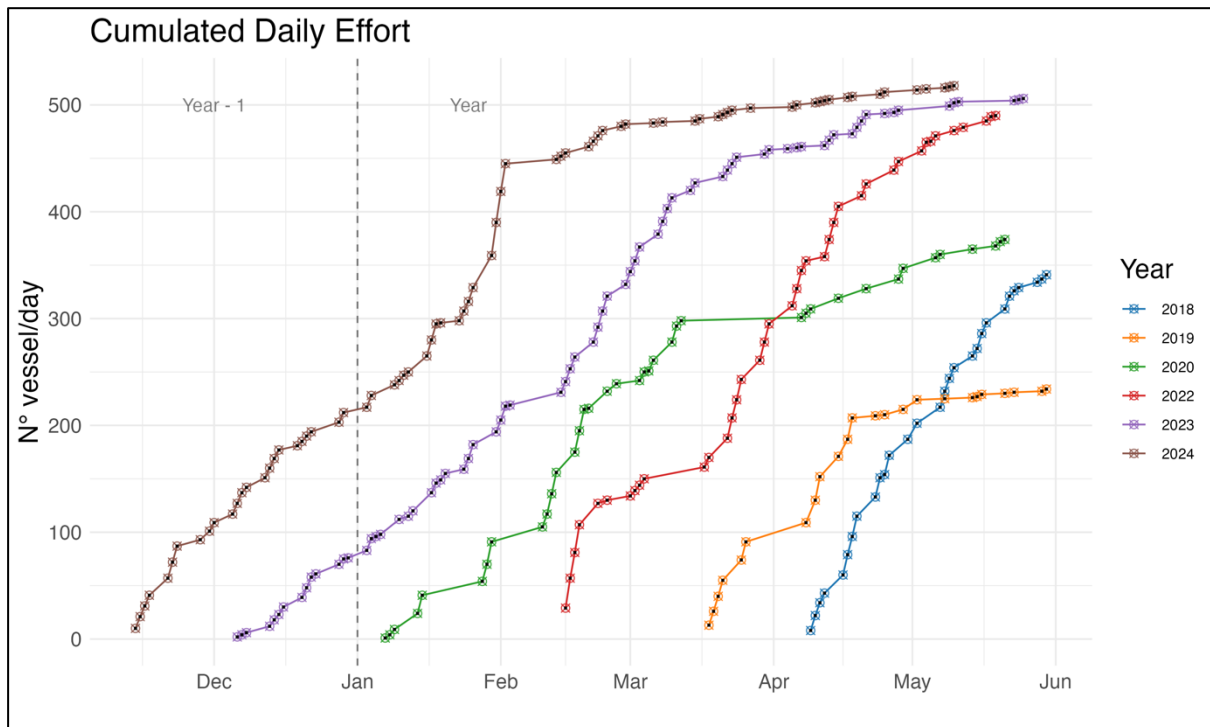


Fig. 49 cumulative daily effort in the six fishing seasons for the last two management plans (n.b. the season is indicated with the year of conclusion)

The graph shows the Cumulated Daily Effort in terms of the number of vessels per day (N° vessels/day) in the six campaigns. In 2022, the fishing season was only able to start on February 14, so there is a steady increase in fishing effort until March, followed by a more gradual increase. In 2023, fishing effort shows a similar initial trend, with a steady growth until February and then a more moderate increase. However, compared to 2022, 2023 shows a higher peak of effort in the spring. This may reflect a response to favorable fishing conditions or increased activity to compensate for less intense fishing periods. The presence of a more pronounced peak may also indicate greater availability of fishery resources during that specific period. As for 2024, fishing effort shows very rapid growth in the early months, reaching high levels as early as January. This reflects the early start of fishing activities, probably due to exceptionally favorable conditions or an optimized resource exploitation strategy. After this initial rapid growth, effort stabilizes, indicating an adaptation of activities in

response to the dynamics of the fishery resources. Comparing the three-year period 2022-2024 with the previous period (2018-2021), there is a general trend of increased fishing effort in the initial months of the year, with a slowdown thereafter. The years 2018 and 2019 show a more gradual and steady growth in fishing effort. The years 2020 and 2021 show greater variability, with significant fluctuations that can be attributed to exceptional events, such as changing environmental conditions.

Analysis of cumulative daily catch (2018-2024)

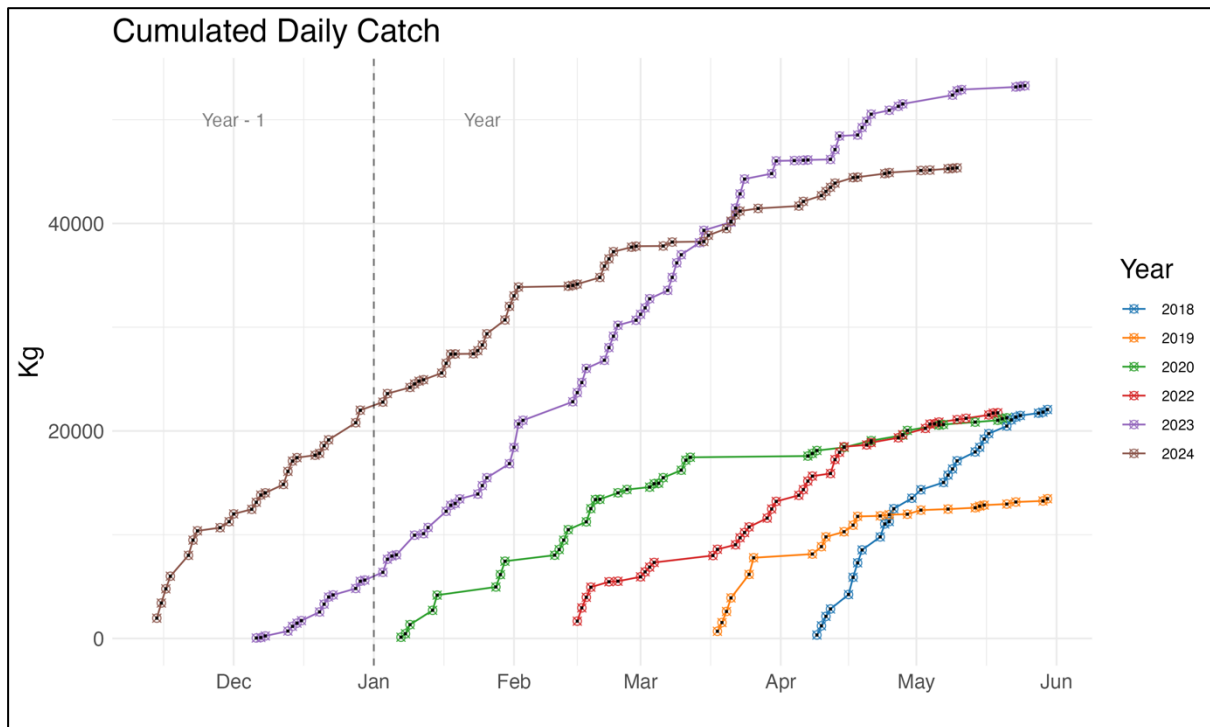


Fig. 50 cumulative total daily catch in the six fishing seasons for the last two management plans (n.b. the season is indicated with the year of conclusion).

The graph shows the cumulative total daily catch (Cumulated Daily Catch) in kilograms (kg) over the six campaigns. In 2022, a start of catch is observed in mid-February because the campaign started late due to administrative issues. Thereafter, steady and rapid growth is observed until the end of May. The year 2023 shows a significant increase in catch compared to 2022, with a start as early as December of the previous year and an increasing trend that continues until the end of April. This increase could indicate greater availability or a change in the distribution of fish resources. Steady growth during the early months of the 2023 season indicates a period of abundance. In 2024, we see an initial trend similar to 2023, with a catch start in November and rapid and steady growth. However, unlike 2023, catches continue to grow at a sustained rate until March and then slow down until the end of the fishing season. This steady and sustained increase suggests effective resource management and possible stability of fish populations, supported by sustainable fishing practices.

The continuity of catches could also indicate an improvement in the prediction of fish school movements. The comparison of the recent three-year period (2022-2024) with the previous period (2018-2020) shows a clear increase in cumulative catch. The years 2018 and 2019 show slower growth and lower total catch volume than the following years. 2020 marks a change, with a more pronounced increase than in previous years, but still lower than the levels observed from 2022 onward. Analysis of the data shows a clear trend of improving cumulative catches in the most recent years, with 2023 and 2024 marking a significant increase over previous years.

Analysis of average daily catches (2018-2024)

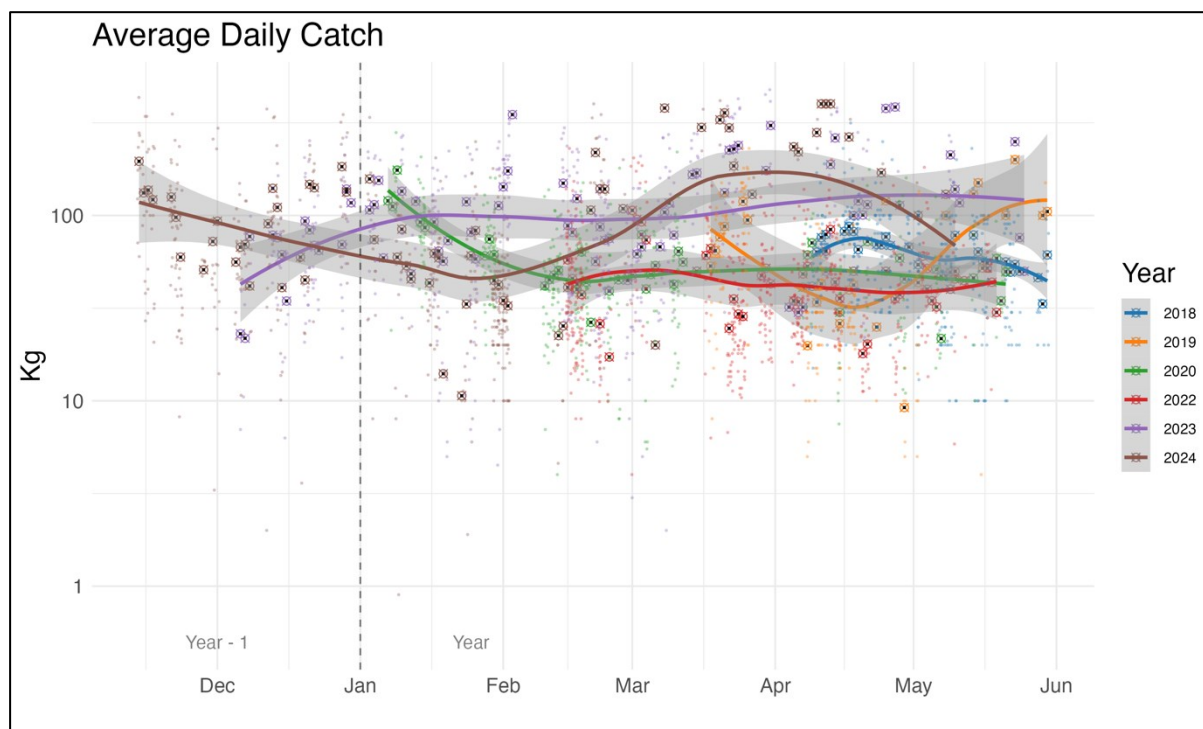


Fig. 51 average daily catch in the six fishing seasons for the last two management plans (n.b. the season is indicated with the year of completion).

The graph shows the average daily catch (Average Daily Catch) in kilograms (kg) over the six campaigns. Analyzing the years 2022, 2023, and 2024, it is observed that 2022 has a relatively stable trend in average daily catch, with values of 44.4 kg in February, 45.1 kg in March, 42.3 kg in April, and 49.0 kg in May. This suggests a steady availability of fish resources during these months, reflecting a period of moderate abundance. 2023 shows an increase in average daily catch, starting from 74.1 kg in December of the previous year, reaching 99.1 kg in January, 92.3 kg in February, 130 kg in March and a peak of 148 kg in April, and 160 kg in May. This steady and marked increase could indicate greater abundance of fish resources and proper resource management. In 2024, more variability is observed than in previous years. Catches start with 110 kg in November of the previous year, decline to 97.1 kg in December, then decline further to 53.3 kg in January, and rise again to 76.0 kg in February. In March, a remarkable peak of 243 kg is observed, followed by 215 kg in April and a

decrease to 65 kg in May. This variability suggests fluctuations in fish populations or changes in environmental conditions affecting fish availability. Comparing these years with 2018-2020, there is a lower consistency in average daily catches. In 2018, catches were 72.3 kg in April and 55.5 kg in May. In 2019, a considerable fluctuation is observed with 33.9 kg in April and 78.2 kg in May. In 2020, average daily catches were relatively low with 46.7 kg in February, 52.7 kg in March, 52.8 kg in April and 45.2 kg in May. Recent years show a trend toward increasing average daily catches, especially in the early months of the year. This trend reflects increased fish availability and sustainable harvest management.

Analysis of effort/catch relationship (2018-2024)

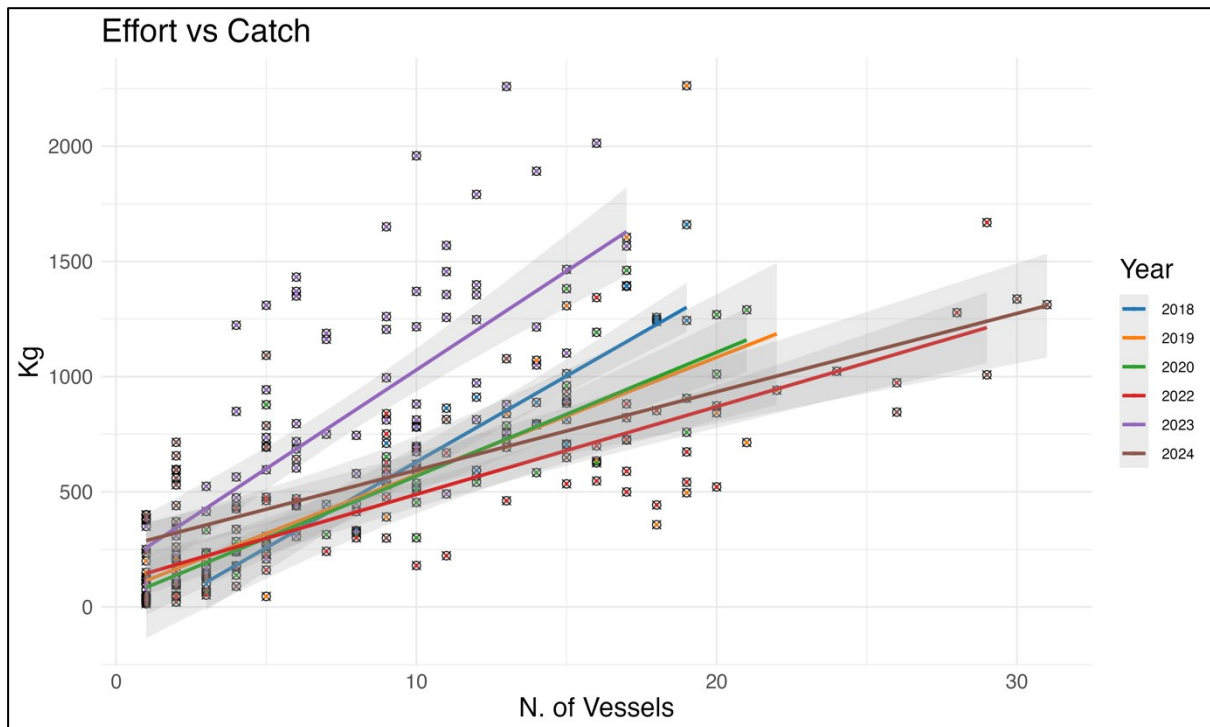


Fig. 52 relationship between effort (number of vessels) and catch (kg) in the six fishing seasons for the last two management plans (n.b. the season is indicated with the year of conclusion).

The graph shows the relationship between effort (number of boats) and catch (kg) in the six campaigns. The scatterplot shows that the relationship between effort and catch shows a positive correlation in all years of the historical series analyzed. Examining the years 2022, 2023 and 2024, an interesting trend is observed. In 2022, the correlation between the number of fishing boats and catch is positive, but with a relatively low slope compared to later years, suggesting moderate efficiency. Average daily catches were 44.4 kg in February, 45.1 kg in March, 42.3 kg in April, and 49.0 kg in May. These data indicate that despite an increase in effort, the increase in catch was not proportionally high, suggesting limited resource abundance or lower efficiency of the fishing techniques used. In 2023, there is a significant increase in catch. The slope of the curve is steeper than in previous years, indicating an increase in fishing efficiency. The average daily catch was 74.1 kg in December of the previous year, 99.1 kg in January, 92.3 kg in February, 130 kg in March, 148 kg in April, and 160 kg in May.

This increase in catch per unit effort suggests greater abundance of fish resources or improvements in fishing techniques and resource management. In 2024, the relationship between effort and catch becomes even more pronounced. The curve shows a very steep increase, indicating very high efficiency. Catches start with 110 kg in November of the previous year, 97.1 kg in December, 53.3 kg in January, 76.0 kg in February, 243 kg in March, 215 kg in April, and 65 kg in May. These data show high variability but remarkably high efficiency peaks, suggesting that during periods of abundance, fishing techniques are extremely effective. Analysis of effort vs catch shows a gradual increase in fishing efficiency, with a positive response of catch to increased effort, particularly for the 2023 season. This improvement can be interpreted as a sign that the fishery resources are being exploited effectively and overfishing has not occurred.

Analysis of the distribution of catch quantity values (2018-2024)

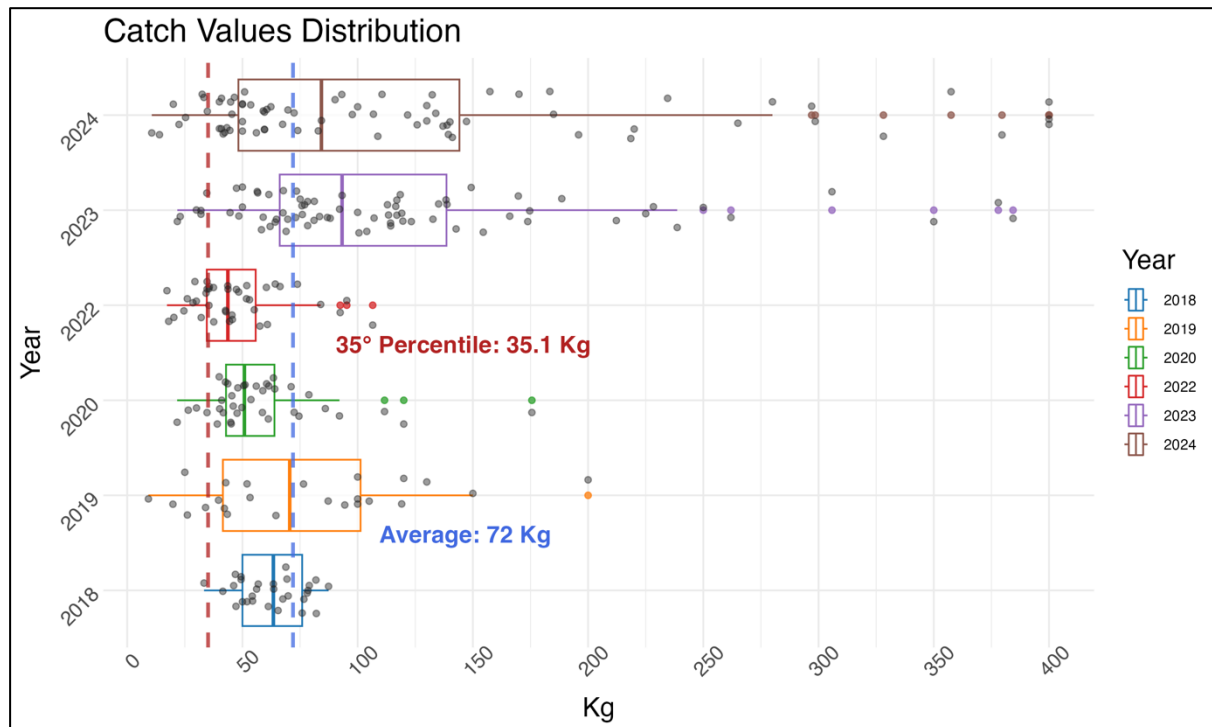


Fig. 53 distribution of catch values (in kg) by year (2018-2024) in the six fishing seasons related to the last two management plans (n.b. the season is indicated with the year of conclusion).

The graph shows the distribution of catch values (in kg) over the six campaigns. Each boxplot represents the distribution of annual catches, highlighting the median, first and third quartiles, as well as points given as outliers. For the year 2022, the distribution of catches is relatively concentrated with a median of 42.3 kg in April and 49.0 kg in May. The median of 30.8 kg in April and 46.4 kg in May indicates that at least half of the daily catch is below these values, suggesting a broader distribution but with a limited peak. The data show that the year had a moderate amount of catch with some high values but with a more concentrated distribution around relatively low median values. In 2023, there is a significant increase in both the mean and median catches. In April, the mean is 148 kg while in May it is 160 kg, with medians of 100 kg and 152 kg respectively. This indicates a significant increase in the amount of fish caught compared to previous years. The higher values and greater dispersion of catches indicate a period of fish abundance. The presence of numerous points above 100 kg

shows that daily catches often exceed this value, signaling a very high fishing efficiency during this period. For 2024, the catch distribution continues to show high variability with significant peaks. The average catch is 215 kg in April and 65 kg in May, while the medians are 200 kg in April and 45 kg in May. This suggests a further increase in fishing efficiency, with some days of exceptionally high catches, as indicated by the numerous values above 200 kg. The greater dispersion of the data and the presence of numerous high values indicate that the year had very productive catches with significant variability. Comparing with previous years (2018-2020), it is observed that in 2018 and 2019, catches were generally lower and less variable. For example, in 2018, the average catch was 72.3 kg in April and 55.5 kg in May, with medians of 70 kg and 45 kg, respectively. In 2019, more variability is seen with an average of 33.9 kg in April and 78.2 kg in May, and medians of 30 kg and 100 kg respectively. This period shows a lower efficiency and amount of catch compared to more recent years, suggesting that the condition of fish resources or fishing techniques were not as advanced. 2020 shows an increase from the previous two years, with an average of 52.8 kg in April and 45.2 kg in May, and medians of 36 kg and 35 kg respectively. However, catches remain more concentrated and less variable than in the years 2023 and 2024, indicating an improvement but not yet at the level of the subsequent observed efficiency gains. The data show a clear upward trend in average daily catch and medians from 2018 to 2024, with increasing variability and more outliers in more recent periods. This suggests a significant improvement in fishing practices and fishery management, leading to higher abundance and wider distribution of daily catch.

5 MANAGEMENT MEASURES

Based on the knowledge gained thanks to the scientific surveys, the present Management Plan for the transparent goby fishery in Manfredonia Gulf during three years from its approval is structured by the following items:

- Fishery control
- Restrictive technical measures
- Monitoring actions
- Control and correction actions
- Management actions time-frame
- Surveillance activity

5.1 Fishery control

5.1.1 Fishing capacity control

- Fleet limitation:** No more than 55 fishing vessels will be authorized to fish transparent goby in the Manfredonia Gulf, based on an annual authorization as established in article 19, paragraph 6 of the EC Regulation 1967/2006, 30 per day of these vessels can effectively operate, due to a shift mechanism. The authorization shall report the fishing gears, the validity period of the fishing license and the unique target species (transparent goby, *Aphia minuta*). Each vessel shall operate only within the Manfredonia Maritime District. The vessel's list with their technical characteristics is annexed. (Annex 2).
- Vessels' shifts:** The shifts are weekly based. The Organizzazione dei Produttori Ittici Sud Adriatico (OP), at least upon a 3-day forewarning, provides the Capitaneria di Porto di Manfredonia (CP, Harbour Master Office) with the list of the 30 vessels operating the following week. The CP provides the OP with the authorizations mentioned in the previous bullet. The authorizations shall be

exhibited by the vessels' captains to the authorities, in case of control on fishing activities. During the weeks in which a vessel is not involved in the scientific survey, its authorization is kept by the CP. Modifications to the vessels shifts can be communicated to the CP, which, if applicable, replaces the unit providing the related authorization.

- c) **Gear limitation:** During the transparent goby fishing operation, it is prohibited to carry onboard any other fishing gear type, complete in all its parts and ready for use.

5.1.2 Fishing activity control

- a) **Fishing season limitation:** the transparent goby fishery can be operated exclusively from 1st November to 31st May. Each vessel can operate for a maximum of 60 days during each fishing season. A total of 600 days at sea can be operated in each fishing season.
- b) **Weekly days limitation:** transparent goby fishery is allowed up to four days per week, from Monday to Thursday.
- c) **Working time limitation:** the authorized vessels can operate exclusively during daylight:
- from November to February:** from 6.00 a.m. to 6.00 p.m.
- from March to May:** from 5.00 a.m. to 5 p.m.
- d) **Species limitation:** the fishery can target transparent goby (*Aphia minuta*) only.

5.2 Restrictive technical measures

- a) **Gear dimensions limitations:** the net cannot be longer than 300 meters, and has to be set with neutral flotation, to avoid the sea bottom impact.

- b) **Mesh size limitation:** the minimum net mesh size shall be within 3 and 5 mm.
- c) **Fishing area limitation:** within the Manfredonia Maritime District, the vessels can operate even nearest the distance of 3 nautical miles from the coast.
- d) **Protected habitats:** fishery in protected habitats is prohibited.
- e) **By-catch limitation:** The total by-catch shall be under the share of 10% of the total catches. They shall be reported on the logbook or on the monitoring modules for the transparent goby catches. The species with an established minimum size (Reg. (CE) n.1967/06, art.15) will be landed and not sold for human consumption (Reg. 1380/13, art. 15).

5.3 Monitoring actions

C.I.R.S.P.E. (Centro Italiano Ricerche e Studi per la Pesca) is the scientific body in charge of monitoring the status of the resource. The evaluation of the status of the stock and the fishery management will be carried out based on the collection of the following data:

- a) **Surveys onboard:** upon request of the scientific body, the fishermen beneficiaries of the Management Plan have to allow the scientists to get on board to check directly the fishing operations, the gear characteristics, spatial monitoring, the catches on target species and by-catch, and to get biological samples, which will be given away free of charge.
- b) **Record form filling:** Authorized vessels shall fill the record form and e-logbook with the data on all the catches, and the position of the vessel. This will be done daily. All following listed elements will be duly reported: the minimum data to collect the quantity of transparent goby, the date, the fishing area, the duration of each fishing operation, the number of fishing operations in a day, the by-catch. During the validity of this management plan, a digital system for computerizing the data will be adopted to replace the paper form.

- c) **Real-time data collection:** The O.P. shall collect daily the logbooks or the record forms compiled by the fishermen and forward them to the scientific body, within 48 hours from the landing.
- d) **Spatial monitoring:** Authorized vessels have to be equipped with a specific spatial monitoring system (ex. GPS).
- e) **Socio-economic data collection:** The O.P. shall collect socio-economic data, as the changes in the stakeholders' income, in the enterprises' revenue, the evaluation of the impact of the Management Plan on employment, the improvement on enterprise competitiveness. The collected data will be forward, once finished the fishing season, to the scientific body, for the analysis of the information.
- f) **Intermediate and final report:** the scientific body shall fill an Annual Report on the activities carried out and on catches operated by the fleet. The report will be focused in particular on the catch per unit effort and on all the necessary information to get sustainable exploitation of the resource.

5.4 Control and correction actions

The **control entity** is composed of a member of the OP, a member of the scientific body C.I.R.S.PE., a member of the Capitaneria di Porto di Manfredonia and a member of the Municipality of Manfredonia.

The control entity monitors the data related to the precautionary limit described in paragraph 3.5 of the present management plan.

Reference point

The reference point is established at 35 kg/vessel/day

In light of the need to take prompt action once the trigger is exceeded, the following pre-defined corrective measures are set:

Alert values

The following alert values, in terms of CPUE, are set:

1. The daily average CPUE falls below the LRP for 3 consecutive days.
2. The daily average CPUE falls, four times within 2 consecutive weeks, below the LRP.

Corrective measures pre-defined

Note: the fishery is allowed from Monday to Thursday (according to the schedules detailed in the paragraph 5.1.2.c), On Friday the week data will be processed and:

-In case 1 (daily average CPUE below the LRP for 3 consecutive days) → the fishery will be suspended for one week.

-In case 2 (daily average CPUE below the LRP for 2 times within 2 consecutive weeks days) → the fishery will be allowed only for 2 days Monday and Wednesday in the following 2 weeks.

Beyond that, the **control entity (compare paragraph 5.4) can take more actions**, concerning the fishing period, the number of vessels effectively in operation, the value of the daily average CPUE recorded and the other biological parameters considered as important for the general evaluation. Where necessary, the Control entity can decide for the temporary suspension of the activities or, if necessary, an early closure.

5.5 Surveillance activity

The transparent goby Management Plan needs a surveillance system able to ensure compliance with the management measures envisaged by the Plan. The Coast Guard (Capitaneria di Porto di Manfredonia) will effectively control and check compliance with the rules set out in the Plan, in particular, through the annual release of licenses and controls on fishing activities in the sea.

5.6 Factors influencing yields and spatial monitoring

The fishing gear

The gear used for transparent goby (*Aphia minuta*) fishery in the Gulf of Manfredonia is a boat seine, described in detail in section 4.2, where the phases of fishing operations are also illustrated.

The net consists of two long arms, called wings, which normally measure between 60 and 110 meters, depending on the size of the entire gear, which is commensurate with the vessels.

The wings are formed by “pieces of netting” which, proceeding towards the codend, decrease in mesh size. Normally the first piece has a mesh size of 40 cm, the second of 20, the third of 10 and the fourth of 5.

Following the last piece of netting that completes the wings is the body of the net, which comprises the codend. The meshes are progressively tightened in the codend too, until a mesh size of 3 mm at its end.

Fishing operations begin with the identification of the school. At this stage, fishermen can assess the biomass of the identified school and the share of individuals belonging to other species. If the biomass of the school is not commercially interesting, or it is not highly monospecific, fishermen do not proceed with fishing operations and continue searching for other schools, based on their knowledge of the dynamics of the resource's movements.

About the degree of mono specificity, It is important to know that the fisherman has high interest in not catching any species other than transparent goby, because the more monospecific is the product presented to the market, the higher is its commercial value.

When the school is deemed suitable, the marker buoy (petagno) is thrown overboard, and the first sweep line equipped with a float begins is dropped overboard. Proceeding toward the sea current, the rest of the gear is dropped, leaving the school downwind.

Once completed the hauling operation by surrounding the school, the boat closes the circle by reaching the float to which the first sweep line is secured. The retrieval of the gear begins with the help of the winch, which hauls in the sweep lines and then the wings, while the body and the net bag are hoisted aboard manually.

The description is like the one presented in the management plan for the use of the “*sonsera*” (boat seine) in Catalonia, adopted with Reg. 1713/2021 of 24/09/2021 and currently being renewed.

Fishing yields are subject to considerable fluctuations, with peaks that can be high. This phenomenon characterizes this type of fishing and is also reported in the scientific report supporting the seine plan in Catalonia, where catch values of 90 kg/day/boat were recorded in March 2011.

In Manfredonia, over the last three years, average yields per campaign peaked in the 2022-2023 campaign with 105.6 kg/day/vessel, while in the previous campaign (year 2022) they stood at 44.4 kg/day/vessel and in the following one (2023-2024) at 87.5 kg/day/vessel, confirming their extreme uncertainty.

In the three campaigns, minimal catches (even below the LRP) were also recorded, followed by days with high yields, again underlining the variability of yields.

In the last six campaigns fluctuating trends have been recorded, with a decrease between 2018 and 2022, a peak in the 2022-2023 campaign and a new decline thereafter.

For short-cycle species, such as the transparent goby, the periods or seasons with declines in biomass indices do not have the significance of a long-term negative trend. The reasons for such variations are to be found in natural causes which determine, through many environmental and biological variables interactions, the abundance of

the resource and its availability for harvesting. The latter is also given by geographical and spatial distribution (distance from the coast, depth). The Gulf of Manfredonia, additionally, represents a place of choice for many species, which concentrate there in considerable densities due to natural causes, as also reported in scientific literature.⁵

Starting with the next campaign, for a better understanding of the structure of the gear and its use, photographic documentation, images and videos recorded during fishing operations, will be produced. Images will be made of the gear deployed at the dock and of fishing operations at sea, as described in the text.

⁵ The Gulf of Manfredonia is located along the Italian coast of the Adriatic Sea in the Apulia region. Many factors contribute to determining the oceanographic characteristics of the Gulf of Manfredonia, such as the WAC (Western Adriatic Current), which is powered by northeast winds and moves the water masses along the Italian coasts in a north vs. south direction. The climate of the area is temperate Mediterranean with alternating dry and rainy seasons. In the last 10 years, rainfall has not exceeded 700 mm/year, which determines the accumulation of nutrients in the river basin. In the event of torrential rains, large quantities of nutrient-rich water are discharged into the gulf, which can cause local eutrophication. Due to its physiographic characteristics, the Gulf of Manfredonia is characterized by shallow, low hydrodynamic, and very productive waters. The abundance of phytoplankton in the area is the basis of the high fish density.

Source: Albenzio, Marzia & della Malva, Antonella & Racioppo, Angela & Speranza, Barbara & Bevilacqua, Antonio. (2024). Valorization of fish from the Adriatic Sea: nutritional properties and shelf-life prolongation of *Aphia minuta* through essential oils. *Frontiers in Nutrition*. 11. 10.3389/fnut.2024.1454228.

The spatial monitoring

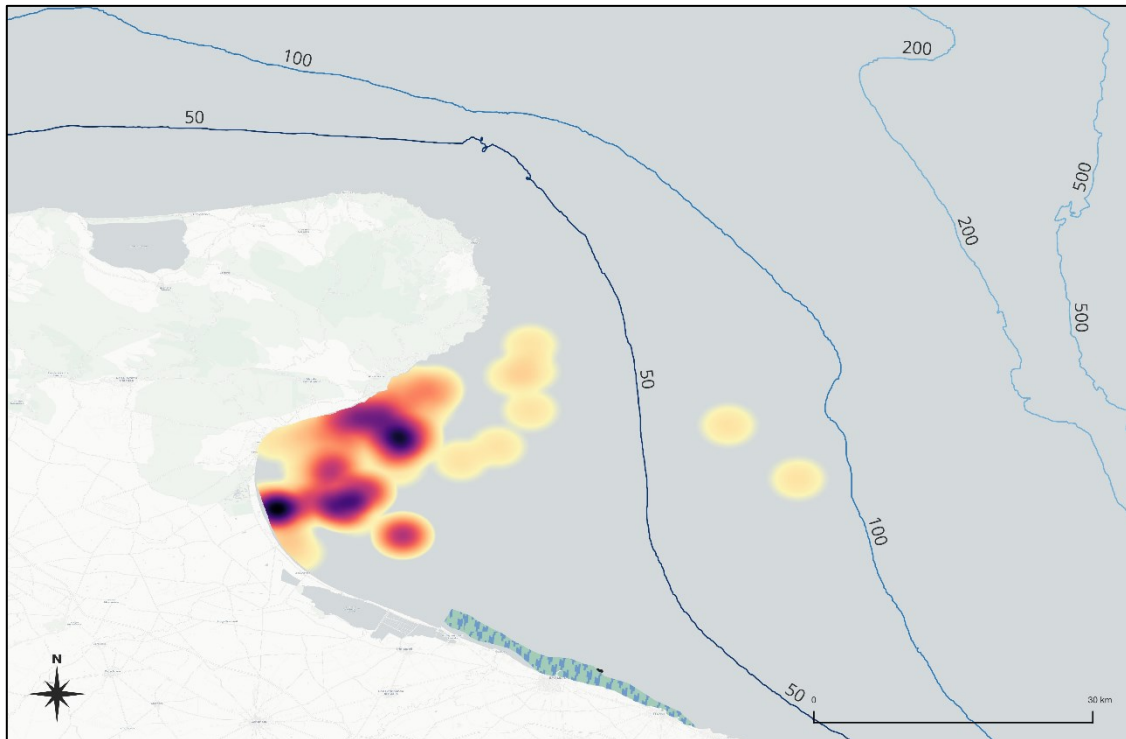
Although the area covered by this particular fishery is fairly limited in size and the vessels involved are not used for travelling long distances, it is interesting to note that they follow the cyclical annual movements of the resource, from its entry into the waters of the Gulf of Manfredonia, until it is commercially viable to harvest it as the distance from the coast increases.

From the survey of haul points carried out during the last campaigns, the movements within the gulf can be derived with good approximation, as boats follow the resource, as described in section 4.2.

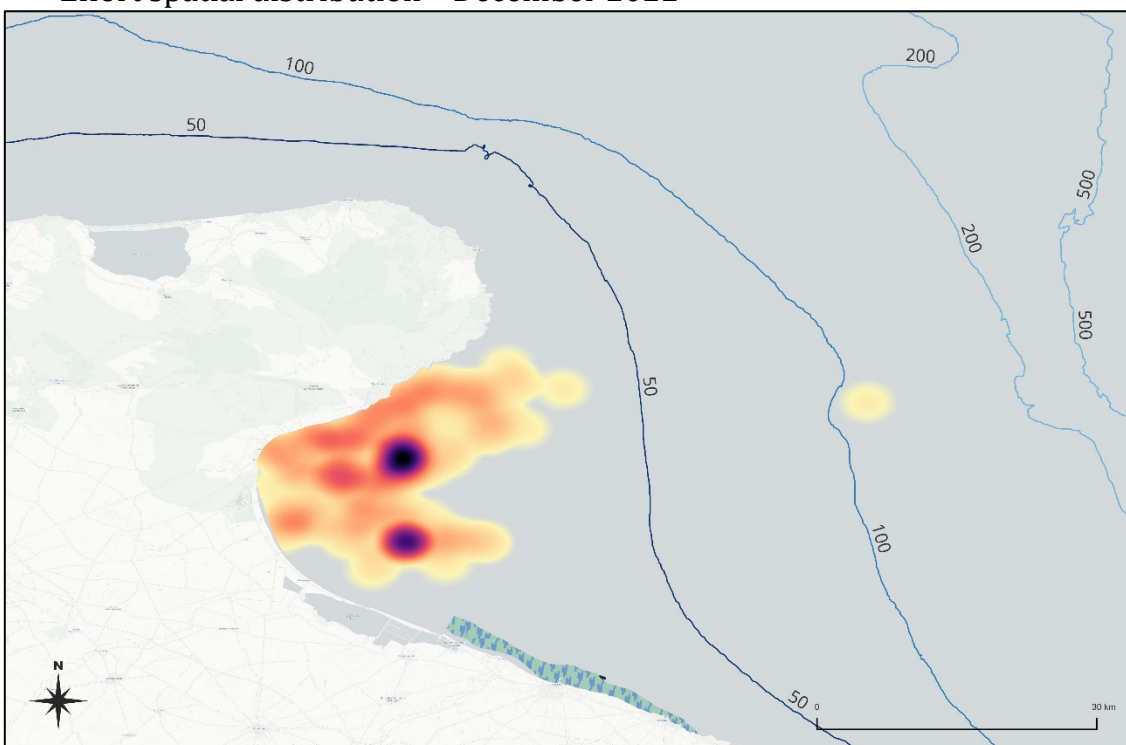
In the sequence of maps, it can be seen how, in the colder months, the transparent goby resource is localized very close to the coast, close to the Gargano promontory. Consequently, the fishing effort is also localized almost entirely in the Northwestern part of the Gulf, within the 50-metre isobath. As the temperature gradually rises from the end of winter, the resource gradually moves eastwards, and the vessels with it.

The resource continues to move offshore in the months from March onwards, while the fishing vessels do not go any further than a distance from the coast, for which the operation is worthwhile, given the running costs, first and foremost the fuel.

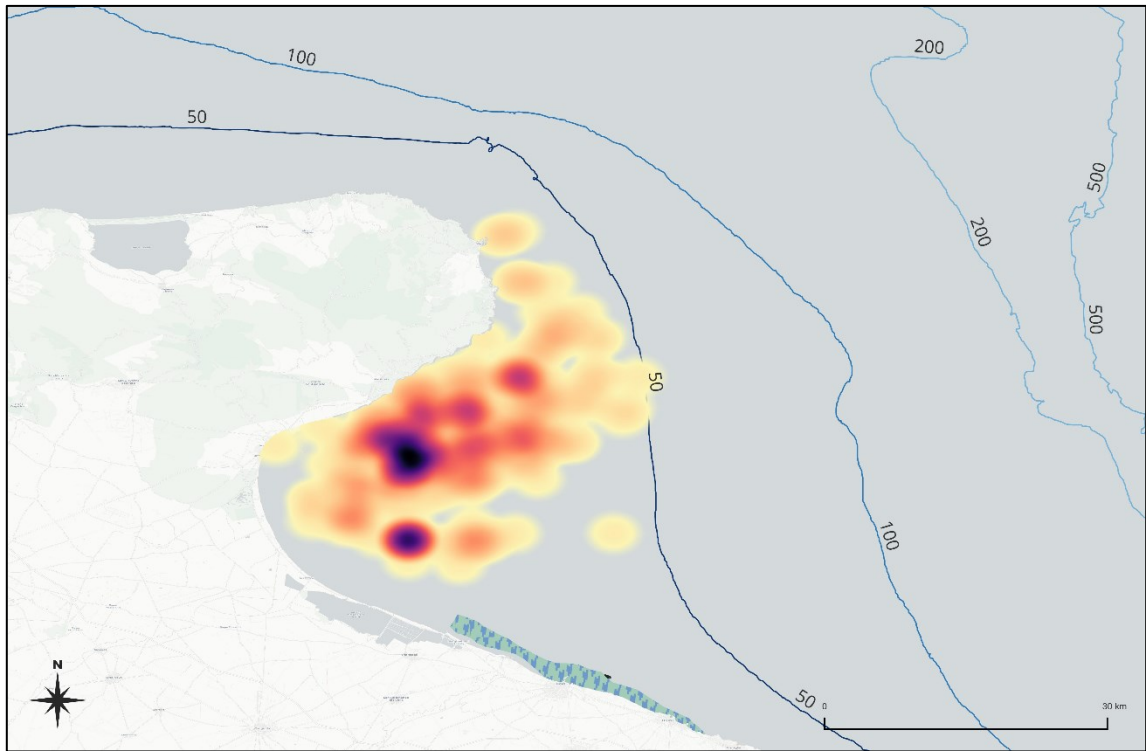
A residual *Posidonia* meadow, unaffected by fishing operations, is also depicted in the pictures.



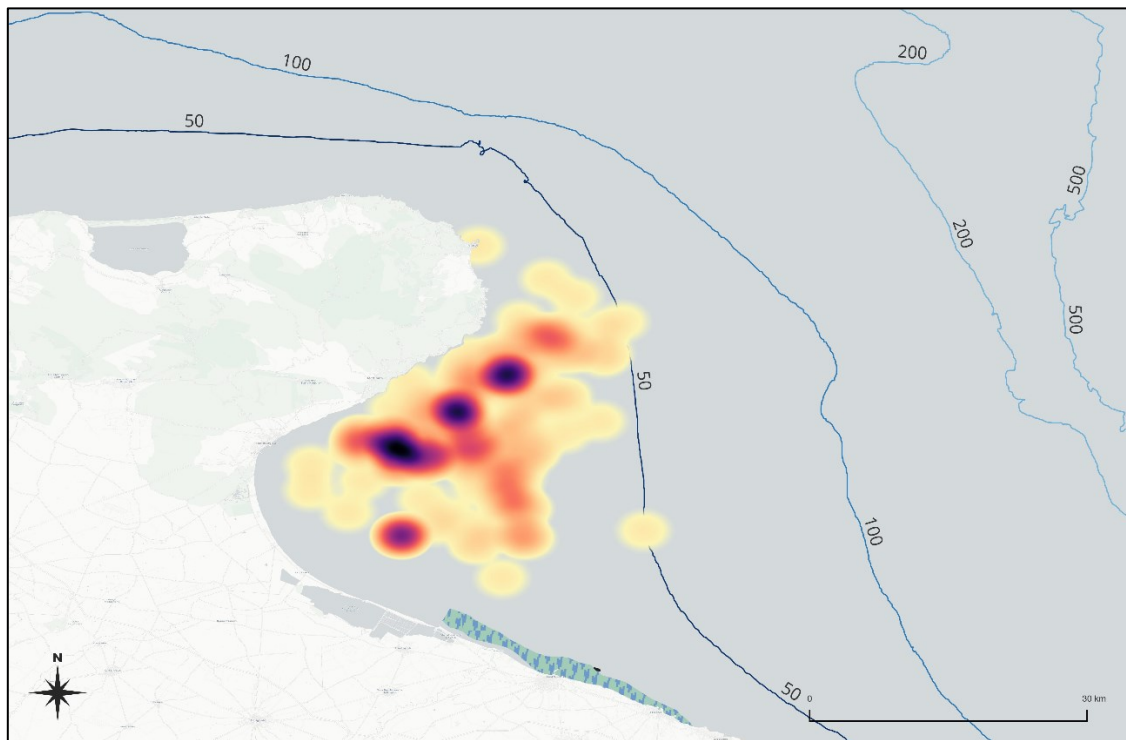
Effort spatial distribution – December 2022



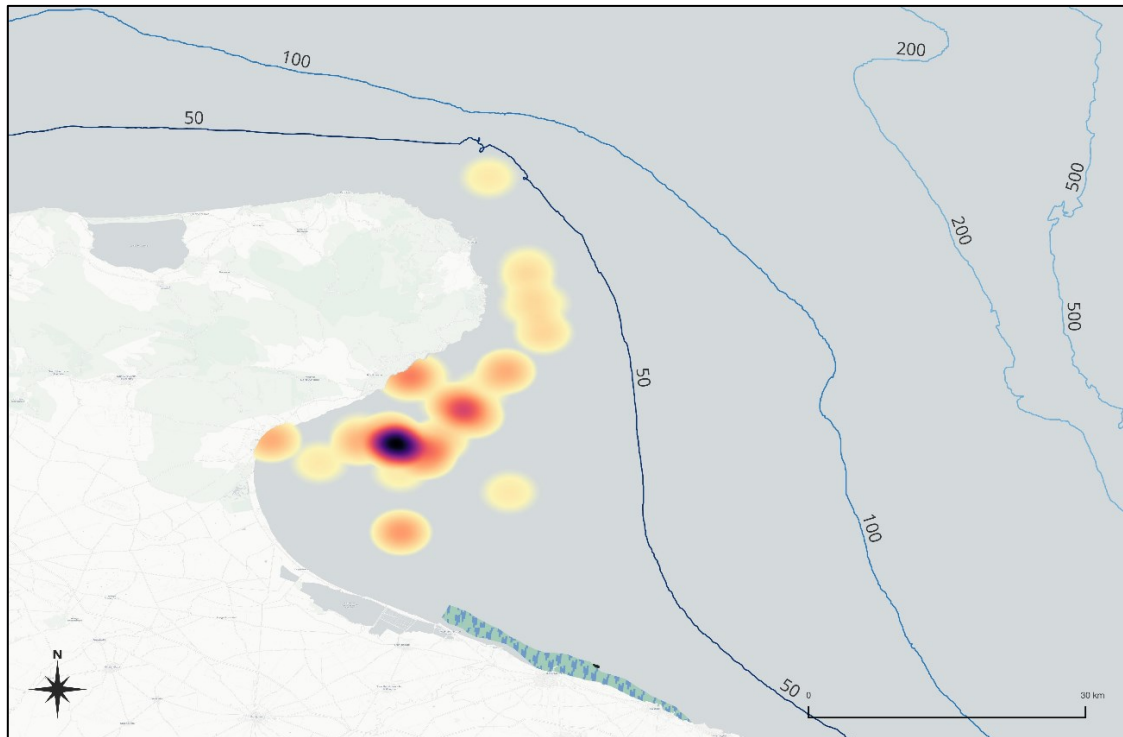
Effort spatial distribution – January 2023



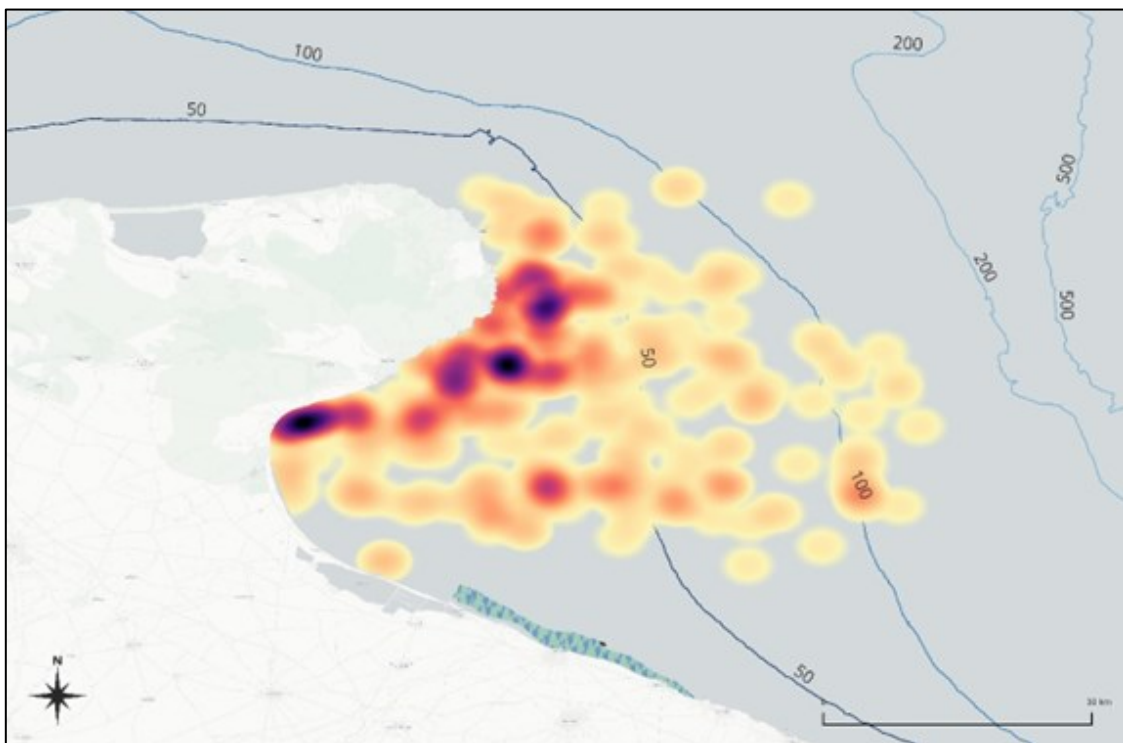
Effort spatial distribution – February 2023



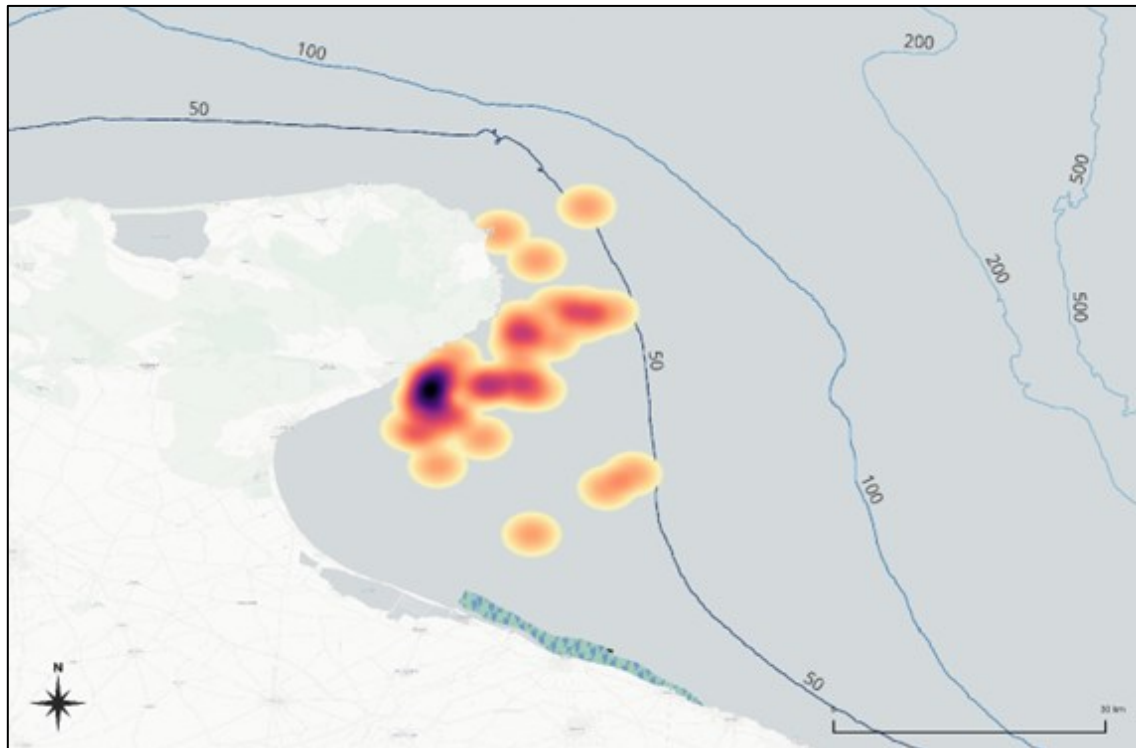
Effort spatial distribution – March 2023



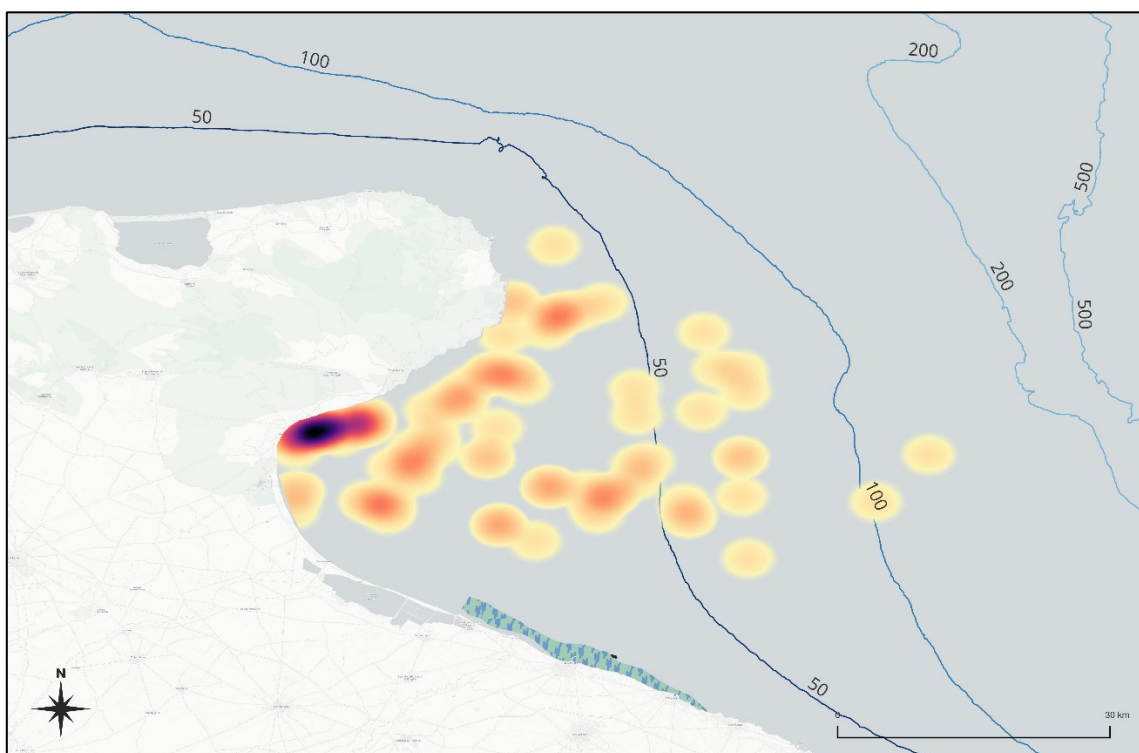
Effort spatial distribution – April 2023



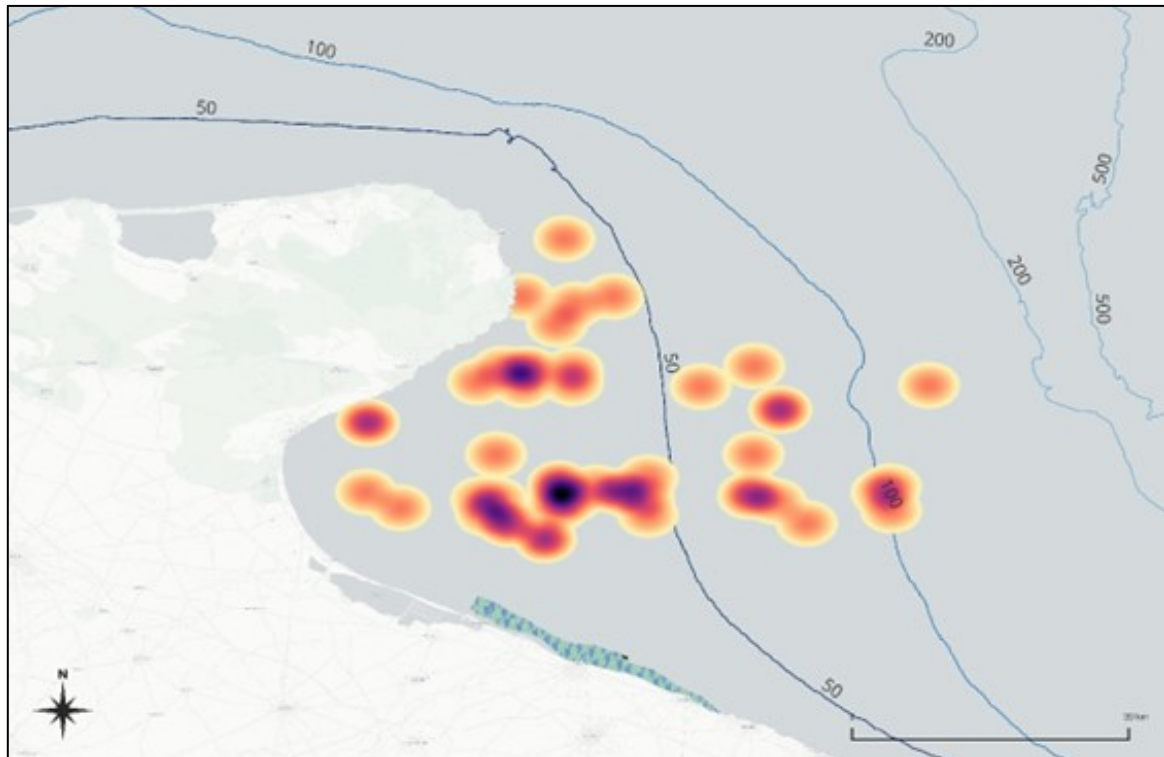
Effort spatial distribution – November 2023



Effort spatial distribution – December 2023



Effort spatial distribution – January 2024



Effort spatial distribution – February 2024

In the collection of georeferenced data from recent campaigns, some difficulties were encountered. In some cases, the data was inhomogeneous, and a validation process was necessary. This inhomogeneity is due to the existence and adoption of different geographical reference systems.

The spatial monitoring of this fishery will be implemented from the next campaign, through a system that will automatically detect the position of the hauls, even for vessels not subject to this obligation, via a user-friendly App for the fisherman. It will therefore no longer be necessary to transcribe the geographical coordinates that the on-board instrumentation reproduces, but these will be stored automatically, minimizing the error events

Therefore, spatial monitoring can also be done in a more immediate way, even if no difficulties were encountered in previous campaigns, related to the location of hauls.

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www.fishbase.org

<http://ec.europa.eu/fisheries/fleet/index.cfm>

Annexes

Annex 1

Proposed Management Plan for Transparent Goby (*Aphia minuta*) in the Manfredonia Maritime District

Socio-Economic questionnaire

A) Period February – April 2013: Single vessels

A1 – general information

A2 – vessel information

A3 – data on the captain

A4 – data on the vessel owner

Observations and/or other matters worth mentioning

B) Period 2009-2010: Cooperatives and fishing enterprises

B1 - general information

B2 – vessels that targeted transparent goby

B3 – data on the cooperatives

Observations and/or other matters worth mentioning

Definitions

A) Period February – April: Single vessels

A1 – general information		
	Date of questionnaire	
	The person who compiled the questionnaire	
	The person interviewed	-
	Contact information (e-mail and/or telephone)	-
A2 - vessel information		
1	Name of the vessel	
2	EU N.	
3	Name of the owner	
4	Name of the captain	
5	Name of the company	
6	Crew on board not including the captain)	Transparent goby (n.):
		Other types of fish (n.):
7	Type of employment contract (partner, employee etc.)	- - -
8	Duration of the contract	- - -

9	Monthly gross pay	- (euro): - (euro): - (euro):
10	Mooring area /port	
A3 – data on the captain		
11	Age	
12	Level of education	
13	Town of residence	
14	How many years have you been involved in fisheries?	
15	How many years have you fished transparent goby?	
16	What other fisheries do you usually carry out?	
17	What is the economic impact of fisheries on your family income	in %:
18	Do you have children over 16?	Specify (n.):
19	If so, are they involved in fisheries?	Specify (n. and occupation):
20	If so, do your children wish to carry on in the fisheries sector, in particular where transparent goby is concerned?	Specify:
A4 – owner information February-April 2013		
21	Catch/vessel	Total (kg):

		transparent goby (%):
		Other fisheries (%):
22	Income/vessel	Total (kg):
		transparent goby (%):
		Other fisheries (%):
23	Intermediate expenditure /vessel	Total (kg):
		transparent goby (%):
		Other fisheries (%):
23	Maintenance costs/vessel	Total (kg):
		transparent goby (%):
		Other fisheries (%):
24	Employment costs/vessel	(euro):
25	Fishing days/vessel	transparent goby (%):
		Other fisheries (%):

Observations and/or other matters worth mentioning

B) Period 2009-2010: Cooperatives and fishing enterprises

B1 – general information		
	Name of the cooperative:	
	Date of questionnaire	
	The person who compiled the questionnaire	
	The person interviewed	-
	Contact information (e-mail and/or telephone)	-
B2 – vessels that targeted transparent goby		
1	Name of the vessel and EU N.	1. 1. 2. 2. 3. 3. 4. 4. 5. 5. 6. 6. 7. 7. 8. ...
2	Crew numbers for transparent goby	(n.):
3	Total number of vessels in the cooperative	(n.):
4	Total number of crew members in the cooperative	(n.):
B3 – data on the cooperative		
5	Catch/year (quantity)	transparent goby (kg):

		Other fisheries (kg):
6	Sale price for transparent goby in relation to the different periods	(euro):
7	Trade channels	
8	End markets	
9	income/year	Total (euro):
		transparent goby (%):
		Other fisheries (%):
10	Intermediate expenditure /vessel	Total (euro):
		transparent goby (%):
		Other fisheries (%):
11	Maintenance costs/year	Total (euro):
		transparent goby (%):
		Other fisheries (%):
12	Employment costs/year	(euro):

1 3	Fishing days/year:	transparent goby (%):
		Other fisheries (%):

Observations and/or other matters worth mentioning

Definitions

Intermediate expenditures: are the value of goods and services consumed or transformed during productive activity. Only those goods that enter the production process once are considered (raw materials and semi-worked materials), those to be consumed (e.g. fuel), or transformed. Capital goods are excluded from this definition, consumption of these is represented by depreciation – capital goods are those that enter the production process more than once (equipment, vessels). Subtracting intermediate expenditure from production value we obtain the added value.

Annex 2

List of interested vessels.

N	External Marking	Vessel Name	CFR	Length m	Tonnage	Main Power
1	00MF3214	ECLISSE	ITA000026070	13,23	21	110
2	00MF2600	ANNA E CATERINA	ITA000006503	14,17	14	87,2
3	00MF3318	NELLA MADRE	ITA000028063	9,4	3	62,5
4	00MF3205	EURO	ITA000025471	15	24	116,9
5	00MF3009	MATTEO GUERRA	ITA000006692	13,1	17	98,5
6	00MF3160	COSIMO VENTURO	ITA000023241	14,46	24	103
7	00MF3013	ADRIATICA II^	ITA000006696	13,3	17	98,5
8	00MF2791	ANTONIO	ITA000006566	13,1	15	108,8
9	00MF3289	SONIA E ANGELA	ITA000007100	8,2	3	15
10	00MF3078	MAMMA RAFFAELLA	ITA000018245	13,27	18	59
11	00MF3007	MARTINA E SAVERIO	ITA000006690	13	16	108,8
12	00MF2910	DOMENICO E ANTONIO II^	ITA000006633	13,04	14	110
13	00MF2413	MARIA GRAZIA II^	ITA000006465	14,1	13	125
14	00MF3175	PAPA' FRANCESCO SAVERIO	ITA000024693	14,25	24	161,8
15	00MF2997	EMANUELE PADRE	ITA000006684	13,3	16	175
16	00MF2889	STELLA MARINA	ITA000006622	12,83	14	125
17	00MF2352	APOLLO 12	ITA000006446	12,05	9	52,2
18	00MF2783	MICHELANGELO	ITA000006562	12,82	13	81,6
19	00MF3180	NUOVO MICHELE LUIGI	ITA000024799	14,4	22	81
20	00MF3312	NUOVA VINCENZA ANTONIETTA	ITA000027914	15,05	15	99,2

21	00MF2722	LA BELLA MARA	ITA000006533	12,49	14	90
22	00MF2211	LE SEI SORELLE	ITA000006424	10,35	5	58,8
23	00MF2829	MOSE'	ITA000006585	12,8	14	110
24	00MF2634	PICCOLO MASSIMO	ITA000006506	12,82	13	81,6
25	00MF3056	LUCIA II^	ITA000006896	12,51	10	109,5
26	00MF3127	ANTONIO MATTEO	ITA000019042	15,09	22	109,5
27	00MF3367	ANGELA E LORENZO	ITA000029866	13,15	10	95,6
28	00MF3092	RAFFAELE FIGLIO	ITA000018551	13,31	17	95,6
29	00MF3016	ELISA MADRE	ITA000006698	13,15	17	108,82
30	00MF2954	LA NUOVA MICHELINA	ITA000006657	13,1	15	104,5
31	00MF3251	MICHELA E GIOVANNI	ITA000026799	14,3	11	104,1
32	00MF3273	VINCENZO PADRE	ITA000006542	13,15	14	87,5
33	00MF2757	SIPONTINA	ITA000027135	14,88	15	100,3
34	00MF2740	RAFFAELLA E FRANCESCO	ITA000006542	13,15	14	87,5
35	00MF3019	ANNA CONCETTA	ITA000006700	13,35	17	108,82
36	00MF2708	LIBERO	ITA000006529	13,13	12	109,9
37	00MF2985	GIOIA	ITA000006676	13,29	16	205,9
38	00MF3108	SANT'ANTONIO DA PADOVA	ITA000018803	12,87	17	107
39	00MF3105	LA NOSTRA ANGELA	ITA000018665	12,1	14	55
40	00MF2456	MARIA TERESA	ITA000006474	10,2	5	28,68
41	00MF2995	ANGELO AZZURRO	ITA000006683	13,14	16	109
42	00MF3095	TENENTE COLONNELLO FATONE	ITA000018553	13,5	19	109,6
43	00MF2945	GERARDO	ITA000006654	14,02	17	109
44	00MF2928	MARIA MICHELA	ITA000006645	13,3	19	109
45	00MF2331	LA FILOMENA	ITA000006438	14	13	60,3
46	00MF3129	MAMMA SORANO	ITA000019055	14,27	21	91,9

47	00MF2471	NUOVA AURORA	ITA000006475	11,17	6	55,1
48	00MF3005	ISABELLA C.	ITA000006688	13,28	17	109
49	00MF2428	NICOLAO	ITA000006472	11,08	7	61,3
50	00MF2406	NUOVO SANT'ANTONIO I^	ITA000006462	11,51	7	58,8
51	00MF2898	AMERIGO VESPUCCI II^	ITA000006627	13,1	14	108,82
52	00MF3064	MATTEO CONOSCIATORE	ITA000018117	12,4	14	110
53	00MF3114	NUOVA MARIA ANTONIETTA	ITA000018848	13,34	19	65,5
54	00MF3199	PASQUALE E SIPONTINA	ITA000025313	14,4	25	104,5
55	00MF2899	ROSA E ANTONIO	ITA000006628	13,04	14	94,8

Annex 3

By catch per vessel 2018 - 2020

2018 by catch - Kg ITA000019001	April				
	10	11	12	16	17
Boops boops					
Loligo vulgaris	1	1,5	1,5		
Parapenaeus longirostris					
Merluccius merluccius					
Trachurus spp	0,5	2	1	0,5	1
total Kg	1,5	3,5	2,5	0,5	1

2018 by catch - Kg ITA000006506	April			May													
	17	18	19	2	7	8	9	10	14	15	16	17	21	22	23	28	29
Boops boops					1		1	0,5	0,5	0,5	0,5	0,5			1	1	1
Loligo vulgaris	0,5	1															
Parapenaeus longirostris																	
Merluccius merluccius				1	0,5	1							0,5	1		0,5	
Trachurus spp	1	1	1,5														
total Kg	1,5	2	1,5	1	1,5	1	1	0,5	0,5	0,5	0,5	0,5	0,5	1	1	1,5	1

2018 by catch - Kg ITA000027914	April		May			
	16	17	7	8	16	28
Boops boops						1
Loligo vulgaris	1	2				
Parapenaeus longirostris						
Merluccius merluccius			1	1	1	0,5
Trachurus spp	1	1				
total Kg	2	3	1	1	1	1,5

2018 by catch - Kg ITA000024799	April						May					
	9	11	16	17	18	19	2	7	8	21	22	23
Boops boops							1	1	1	0,5	1	1
Loligo vulgaris	1	2	1	3	2	2,5						

Parapenaeus longirostris												
Merluccius merluccius							2	2	2	0,5		
Trachurus spp	0,5	1,5	1	1	1	0,5						1
total Kg	1,5	3,5	2	4	3	3	3	3	3	1	1	2

2018 by catch - Kg ITA000006692	April				May													
	16	17	18	19	2	7	8	9	10	14	15	16	17	21	22	28	29	30
Boops boops					0,5	1	1	2	3	3	1	2	3	1,5	1	3,5	1	1
Loligo vulgaris	1,5	1	1	1,5														
Parapenaeus longirostris																		
Merluccius merluccius					2	2	2	2	4	2	4	3	2	3	0,5	2,5	1	3
Trachurus spp	1,5	2	2	1,5														
total Kg	3	3	3	3	2,5	3	3	4	7	5	5	5	5	4,5	1,5	6	2	4

2018 by catch - Kg ITA000018117	April							May									
	10	11	12	16	17	18	19	2	7	8	9	10	14	16	17	21	22
Boops boops								0,5			1	2	2		1		
Loligo vulgaris	0,9	2	1,5	1	0,5	2	1									0,9	
Parapenaeus longirostris																	
Merluccius merluccius								2	2	2		1,4	1	2		0,5	1
Trachurus spp	0,9	1,5	0,5	1	1	1	0,5										
total Kg	1,8	3,5	2	2	1,5	3	1,5	2,5	2	2	1	3,4	3	2	1	1,4	1

2018 by catch - Kg ITA000006465	April					May					
	10	11	17	18	19	2	14	16	17	21	22
Boops boops						3,2	2	1,5	2	1	1,5
Loligo vulgaris	1	2,5	1	2	2						

Parapenaeus longirostris											
Merluccius merluccius						2	3	3,5	2,5	3	1
Trachurus spp	1,6	2	1,5	1	2						
total Kg	2,6	4,5	2,5	3	4	5,2	5	5	4,5	4	2,5

2018 by catch - Kg ITA000006474																			
	April				May														
	12	16	17	18	2	7	8	9	10	14	15	16	17	21	22	24	28	30	
Boops boops					1	1	2	1,5	1	2,5	0,5	1,5	1,5	2	1,5				
Loligo vulgaris	2	0,5	1	1										0,5	0,5		0,5	1	
Parapenaeus longirostris																			
Merluccius merluccius					1	2	1	1	1		3,5	1,5	2	1,5	2	1	0,5	1,5	
Trachurus spp	1	1,5	1	1															
total Kg	3	2	2	2	2	3	3	2,5	2	2,5	4	3	3,5	4	4	1	1	2,5	

2018 by catch - Kg ITA000018665	April								May										
	9	10	11	12	16	17	18	19	2	7	8	9	10	15	16	17	21	23	24
Boops boops									1	2	2	2	2	2	2	2	1,5	1,5	2,5
Loligo vulgaris	1	1,75	2	3	0,5	0,5	1	1,5											
Parapenaeus longirostris																			
Merluccius merluccius									1,5	1	3	2	3	3	3	1,5	1,5	2	1,5
Trachurus spp	1	1,75	1	1	1,5	2,5	1	1											
total Kg	2	3,5	3	4	2	3	2	2,5	2,5	3	5	4	5	5	5	3,5	3	3,5	4

2018 by catch - Kg ITA000006529	April						May					
	10	11	12	17	18	19	2	7	8	10	16	17
Boops boops							1	2	1	4		0,5
Loligo vulgaris	0,5	3	2	1,5	1	1						

Parapenaeus longirostris												
Merluccius merluccius							2	1	2	3,5	3	1
Trachurus spp	1,5	1,5	1	1,5	1	1						
total Kg	2	4,5	3	3	2	2	3	3	3	7,5	3	1,5

2018 by catch - Kg ITA000006688	April					May			
	10	16	17	18	19	2	7	8	9
Boops boops						1		1	0,5
Loligo vulgaris	2	1	1	1	0,5				
Parapenaeus longirostris									
Merluccius merluccius							1	0,5	
Trachurus spp	1	1	1	1	1				
total Kg	3	2	2	2	1,5	1	1	1,5	0,5

2018 by catch - Kg ITA000026070	April							May							
	9	10	11	16	17	18	19	2	7	8	9	14	17	21	22
Boops boops								2	0,5				1	1	0,5
Loligo vulgaris	0,5	2	0,7	1	1	1	0,5								
Parapenaeus longirostris															
Merluccius merluccius								1	2	2	2	2,5	1	1	1
Trachurus spp	0,2			1	1	0,7	1								
total Kg	0,7	2	0,7	2	2	1,7	1,5	3	2,5	2	2	2,5	2	2	1,5

2018 by catch - Kg ITA000006653	April	
	18	19
Boops boops		
Loligo vulgaris	2	1

Parapenaeus longirostris		
Merluccius merluccius		
Trachurus spp	2	2
total Kg	4	3

2018 by catch - Kg ITA000006684	April						May							
	10	11	12	16	17	18	2	7	8	9	14	16	21	22
Boops boops							1				1	0,5	1	0,5
Loligo vulgaris	1,25	1,8	0,5	0,5	1	1								
Parapenaeus longirostris														
Merluccius merluccius							2	1	1,4	2,6	0,5	0,5	0,4	0,5
Trachurus spp	1,25	1	0,5	0,5	1	0,5								
total Kg	2,5	2,8	1	1	2	1,5	3	1	1,4	2,6	1,5	1	1,4	1

2018 by catch - Kg ITA000006642	April					
	9	10	11	16	17	18
Boops boops						
Loligo vulgaris	0,5	1	1,3	1,5	2	2
Parapenaeus longirostris						
Merluccius merluccius						
Trachurus spp	0,7	1	0,5	2	2	1
total Kg	1,2	2	1,8	3,5	4	3

2018 by catch - Kg ITA000006705	April								May									
	9	10	11	16	17	18	19		7	8	9	10	14	16	21	22	23	30
Boops boops									1	1	1	0,5	1	1	2	2	1	1
Loligo vulgaris	0,5	3	3,5	1,5	1	2	1,5											

Parapenaeus longirostris																	
Merluccius merluccius								0,5	0,3	2	2	7	0,5	2	1	1,5	
Trachurus spp	0,5	2,5	4	1,5	1	1	0,5										
total Kg	1	5,5	7,5	3	2	3	2	1,5	1,3	3	2,5	8	1,5	4	3	2,5	1

2018 by catch - Kg ITA000016902	April		
	17	18	19
Boops boops			
Loligo vulgaris	1,5	1	0,5
Parapenaeus longirostris			
Merluccius merluccius			
Trachurus spp	1,5	1	0,5
total Kg	3	2	1

2018 by catch - Kg ITA000018385	April						May										
	9	10	12	17	18	19	2	7	8	9	10	14	16	21	22	23	30
Boops boops									3	2	1	1	2	3	2	3	2
Loligo vulgaris	1,5	2	3	3	2	3											
Parapenaeus longirostris																	
Merluccius merluccius							2	3,5	1,5	1	2,5	2,5	1,5	2	1	1,5	1
Trachurus spp	3	1,5	3	2	2	3,5											
total Kg	4,5	3,5	6	5	4	6,5	2	3,5	4,5	3	3,5	3,5	3,5	5	3	4,5	3

2018 by catch - Kg ITA000006503	April		May	
	9	19	16	29
Boops boops				
Loligo vulgaris	1,5	1	1	0,5

Parapenaeus longirostris				
Merluccius merluccius			1,5	1
Trachurus spp	0,5	1		
total Kg	2	2	2,5	1,5

2018 by catch - Kg ITA000006566	April							May										
	9	10	11	16	17	18	19	2	7	8	9	10	14	15	16	17	21	22
Boops boops								0,5	1		1					0,5	0,5	0,5
Loligo vulgaris	2,1	1	2,1	1	1	1	1											
Parapenaeus longirostris																		
Merluccius merluccius								0,7	0,3	1		0,5	1	0,5	0,5	0,5		1
Trachurus spp	0,5	1,5	1,5	1	1	1	1											
total Kg	2,6	2,5	3,6	2	2	2	2	1,2	1,3	1	1	0,5	1	0,5	0,5	1	0,5	1,5

2018 by catch - Kg ITA000019425																
	April				May											
	10	11	16	17	2	7	8	9	10	14	15	16	17	21	22	
Boops boops						1			1	1	1	0,5	0,5	1	1	
Loligo vulgaris	1	2	0,5	1												
Parapenaeus longirostris																
Merluccius merluccius					1		1	1,3		1	0,5	1	1	0,5	0,5	
Trachurus spp	0,5	1	1	0,5												
total Kg	1,5	3	1,5	1,5	1	1	1	1,3	1	2	1,5	1,5	1,5	1,5	1,5	

2019 by catch - ITA000006566	March						April							
	18	19	20	21	25	26	8	10	11	15	17	18	23	29
Loligo vulgaris							0,5	0,8	0,7	0,5	0,5		0,5	0,5

Parapenaeus longirostris			1,4	0,6										
Merluccius merluccius	1	1		1	1	2								
Trachurus spp	1,5	1,5	1,6	1	2,5	2	0,5	0,7	0,8	0,5	0,8			
Total Kg	2,5	2,5	3	2,6	3,5	4	1	1,5	1,5	1	1,3	0	0,5	0,5

2019 by catch - ITA000006503	March					April					
	19	20	21	25	26	8	10	11	15	17	18
Loligo vulgaris						0,5	0,65	1	0,5	1	0,5
Parapenaeus longirostris	1,5	1,5	1								
Merluccius merluccius	2,5	0,5	0,5	5	3						
Trachurus spp	1		1,5	4	2	1	0,25		0,4	0,5	0,4
Total Kg	5	2	3	9	5	1,5	0,9	1	0,9	1,5	0,9

2019 by catch - ITA000006700	March				
	19	20	21	25	26
Loligo vulgaris					
Parapenaeus longirostris		0,4	2		
Merluccius merluccius	1	1	1		2
Trachurus spp	0,8	0,5	1	3	1
Total Kg	1,8	1,9	4	3	3

2019 by catch - ITA000019042	April			May
	8	10	11	2
Loligo vulgaris	0,75	0,55	0,7 5	

Boops boops				0,5
Trachurus spp		0,7	1,2 5	
Total Kg	0,75	1,25	2	0,5

2019 by catch - ITA000019425	March				April						May
	20	21	25	26	8	10	11	15	17	18	2
Loligo vulgaris					0,5	0,5	0,5	1,3	1	1	
Boops boops											0,5
Parapenaeus longirostris	0,5	0,7									
Merluccius merluccius	1	0,8	4								0,5
Trachurus spp	0,5	0,5	3	1	0,75	0,2	1		0,7	0,5	
Total Kg	2	2	7	1	1,25	0,7	1,5	1,3	1,7	1,5	1

2019 by catch - ITA000006696	March		April				
	25	26	8	10	11	15	18
Loligo vulgaris			0,7 5	1,5	1		0,5
Parapenaeus longirostris							
Merluccius merluccius	1,5						
Trachurus spp	1	2	0,5	0,5	0,5		
Total Kg	2,5	2	1,2 5	2	1,5	0	0,5

2019 by catch - ITA000006627	April		
	8	10	11
Loligo vulgaris	0,75	0,75	0,5
Parapenaeus longirostris			
Merluccius merluccius			
Trachurus spp	0,5	0,75	0,7 5
Total Kg	1,25	1,5	1,2 5

2019 by catch - ITA000024693	Apr
	8
Loligo vulgaris	0,5

Parapenaeus longirostris	
Merluccius merluccius	
Trachurus spp	0,25
Total Kg	0,75

2019 by catch - ITA000006698	April		
	8	10	11

Loligo vulgaris	0,3	1	0,6 9
Parapenaeus longirostris			
Merluccius merluccius			
Trachurus spp	0,35	0,5	0,6
Total Kg	0,65	1,5	1,2 9

2019 by catch - ITA000024799	April			May
	8	10	11	2
Loligo vulgaris	0,25	1,5	1,2 5	
Boops boops				0,3
Merluccius merluccius				0,2
Trachurus spp	0,25	1,5	1,7	

Total Kg	0,5	3	2,9 5	0,5
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2019 by catch - ITA000006529	April		
	11	15	18
Loligo vulgaris	1,5	1	1
Parapenaeus longirostris			
Merluccius merluccius			
Trachurus spp	1	0,5	1,3
Total Kg	2,5	1,5	2,3

2019 by catch - ITA000006657	Mar			April					
	21	25	26	8	10	11	15	17	18
Loligo vulgaris					0,5	0,5	0,5	1	2
Boops boops									
Parapenaeus longirostris	0,9								
Merluccius merluccius	2,5	3	1,5						
Trachurus spp	1,6	2		0,25	0,2	0,75	0,5	0,4	2,5
Total Kg	5	5	1,5	0,25	0,7	1,25	1	1,4	4,5

2019 by catch - ITA000006688	April		
	8	10	11

Loligo vulgaris	0,3	0,9	0,7 5
Parapenaeus longirostris			
Merluccius merluccius			
Trachurus spp		0,1	0,8
Total Kg	0,3	1	1,5 5

2019 by catch - ITA000019055	May	
	2	16
Loligo vulgaris		
Boops boops	0,5	
Merluccius merluccius	0,5	0,2
Trachurus spp		
Total Kg	1	0,2

2019 by catch - ITA000025471	April		
	8	10	11
Loligo vulgaris	1	1,5	
Parapenaeus longirostris			
Merluccius merluccius			
Trachurus spp	0,5	1,1	1,5
Total Kg	1,5	2,6	1,5

2019 by catch - ITA000006684	April		
	8	10	11
Loligo vulgaris	0,1	1	1,5
Parapenaeus longirostris			
Merluccius merluccius			
Trachurus spp	0,2	0,5	1,5
Total Kg	0,3	1,5	3

2019 by catch - ITA000006637	April		
	8	10	11
Loligo vulgaris		0,5	1,5
Parapenaeus longirostris			
Merluccius merluccius			
Trachurus spp	1	1	0,5

Total Kg	1	1,5	2
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2019 by catch - ITA000016902	April		
	8	10	11
Loligo vulgaris	0,2	1	0,9
Parapenaeus longirostris			
Merluccius merluccius			
Trachurus spp	0,23	0,5	0,6

Total Kg	0,43	1,5	1,5
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2019 by catch - ITA000025313	April		
	8	10	11
Loligo vulgaris	0,6	1,25	0,7 5
Parapenaeus longirostris			
Merluccius merluccius			
Trachurus spp	0,6	0,25	1,1
Total Kg	1,2	1,5	1,8 5

2019 by catch - ITA000006705	April			May	
	8	10	11	2	30

Loligo vulgaris	0,6	1	0,7 5		
Boops boops					3
Merluccius merluccius				0,7	
Trachurus spp	0,6	1	1,5		
Total Kg	1,2	2	2,2 5	0,7	3

2019 by catch - ITA000006465	Mar	April	
	25	8	11
Loligo vulgaris		0,5	1,7
Parapenaeus longirostris			
Merluccius merluccius	2		
Trachurus spp	5	0,5	0,3
Total Kg	7	1	2

2019 by catch - ITA000006628	March		
	19	20	21
Loligo vulgaris			
Parapenaeus longirostris	0,6		
Merluccius merluccius	0,4		
Trachurus spp	0,2		

Total Kg	1,2	0	0
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2019 by catch - ITA000006506	March			
	19	20	25	26
Loligo vulgaris				
Parapenaeus longirostris	0,5	1		
Merluccius merluccius	1	0,9	4,5	
Trachurus spp	1	1,1	2	2
Total Kg	2,5	3	6,5	2

2019 by catch - ITA000006896	March				
	19	20	21	25	26
Loligo vulgaris					
Parapenaeus longirostris	0,8	1,8	1,3		
Merluccius merluccius		2,2	2	2	1
Trachurus spp	1,5	1	0,5	2	
Total Kg	2,3	5	3,8	4	1

2019 by catch - ITA000006649	March					April						May
	19	20	21	25	26	10	11	15	18	25	29	2
Loligo vulgaris						0,3	0,6	0,5	1	3	0,3	
Boops boops												2

Parapenaeus longirostris		2,6	2,5									
Merluccius merluccius	2,6	2	2	4,5	4							1
Trachurus spp	1,75	2	2	3	4	0,2	0,4	0,5	0,5	3		
Total Kg	4,35	6,6	6,5	7,5	8	0,5	1	0,5	1,5	6	0,3	3

2019 by catch - ITA000006622	March					April				May
	19	20	21	25	26	10	11	15	18	2
Loligo vulgaris						1	0,65			
Boops boops										0,1
Parapenaeus longirostris		1,5								
Merluccius merluccius	0,65	0,4	1	3,5	2					
Trachurus spp	0,3	1,5	2,5 5	3	2		1,1	0,5	1	
Total Kg	0,95	3,4	3,5 5	6,5	4	1	1,75	0,5	1	0,1

2019 by catch - ITA000018665	March					April					May
	19	20	21	25	26	10	11	15	17	18	2
Loligo vulgaris						1	0,6		0,6	0,5	
Boops boops											1,5
Parapenaeus longirostris		1,5	1								
Merluccius merluccius	1,75	1	0,9	2	3						1,5
Trachurus spp	1	2		2	4	0,5	1,5	0,6	0,5	0,5	
Total Kg	2,75	4,5	1,9	4	7	1,5	2,1	0,6	1,1	1	3

2019 by catch - ITA000026070	March					April			
	19	20	21	25	26	8	10	11	18
Loligo vulgaris						0	0,4	1,5	2
Parapenaeus longirostris		2	1,5						
Merluccius merluccius	1,5	1	1,9	3	5				
Trachurus spp	1,5	1	1,6	4	4	0	0,35	2	2,5
Total Kg	3	4	5	7	9	0	0,75	3,5	4,5

2019 by catch - ITA000006690	March				
	19	20	21	25	26
Loligo vulgaris	1				
Parapenaeus longirostris		2			
Merluccius merluccius	0,6	1	1,5	5	2,5
Trachurus spp		0,3	1,6	2	

Total Kg	1,6	3,3	3,1	7	2,5
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2019 by catch - ITA000007100	March				
	19	20	21	25	26
Loligo vulgaris		0,7			
Parapenaeus longirostris			1,8		
Merluccius merluccius	0,7	1,3	1,2	3	1,6
Trachurus spp			1	2	2
Total Kg	0,7	2	4	5	3,6

2019 by catch - ITA000006474	March				Apr	May							
	19	20	25	26	17	8	14	15	16	21	23	29	30
Boops boops						0,5	2	2	1	2	1	1	3,5
Loligo vulgaris					2								
Parapenaeus longirostris	1,9	3											
Merluccius merluccius	2,5	1	6,5	5		1,5	0,5	2	2	1	2,5	1	1
Trachurus spp	0,3	1,4	5	4	3								
Total Kg	4,7	5,4	11, 5	9	5	2	2,5	4	3	3	3,5	2	4,5

2019 by catch - ITA000006562	Mar
	25
Boops boops	
Loligo vulgaris	

Parapenaeus longirostris	
Merluccius merluccius	
Trachurus spp	2
Total Kg	2

2019 by catch - ITA000006658	March	
	25	26
Boops boops		
Loligo vulgaris		
Parapenaeus longirostris		
Merluccius merluccius	3,5	6

Trachurus spp	3	5
Total Kg	6,5	11

2019 by catch - ITA000006692	March	
	25	26
Boops boops		
Loligo vulgaris		
Parapenaeus longirostris		
Merluccius merluccius	3,5	3
Trachurus spp	4	2
Total Kg	7,5	5

2020 by catch - ITA000006474	January			February							
	28	29	30	11	12	13	17	18	19	24	26
Boops boops	1	0,5	1		1	1					
Loligo vulgaris	1	1	1	0,5		1	1	1	1	0,5	1
Parapenaeus longirostris											
Merluccius merluccius				0,5	1	0,5	1,7	1	1	0,5	0,5
Trachurus spp											
Total Kg	2	1,5	2	1	2	2,5	2,7	2	2	1	1,5

2020 by catch - ITA000006465	February						
	10	12	13	17	18	19	24
Boops boops							

Loligo vulgaris	1	0,5	0,2	0,5	1	0,25	0,5
Parapenaeus longirostris							
Merluccius merluccius	0,5	0,5		0,3	1	0,25	
Trachurus spp							
Total Kg	1,5	1	0,2	0,8	2	0,5	0,5

2020 by catch - ITA000006526	January			February		
	0	29	30	10	12	13
Boops boops	0	1	1			
Loligo vulgaris	0	1		1	1,5	0,5
Parapenaeus longirostris						
Merluccius merluccius				0,5	1	0,5
Trachurus spp						
Total Kg	0	2	1	1,5	2,5	1

2020 by catch - ITA000006649	February					Mar
	10	11	12	17	18	5
Boops boops	1		1,4			
Loligo vulgaris		0,5	0,5	1	1	1
Parapenaeus longirostris						
Merluccius merluccius	1	0,5		2,6	2	
Trachurus spp						0,6
Total Kg	2	1	1,9	3,6	3	1,6

2020 by catch - ITA000006692	January			February									March			April				
	28	29	30	10	11	12	13	17	18	19	24	26	3	5	10	6	7	8	14	20
Boops boops	1,5	0,5	0,5																	
Loligo vulgaris	0,5	0,8		0,5	0,5	1	1	1	3,8	1	1	0,5				1		1,5	0,6	0,
Parapenaeus longirostris																				

Merluccius merluccius			0,5	1	0,5	1	1	1	1,2	1	1	0,5	0,5	1	0,5					
Trachurus spp													0,5	1	1	2	1	1,5	0,6	1,
Total Kg	2	1,3	1	1,5	1	2	2	2	5	2	2	1	1	2	1,5	3	1	3	1,2	2,

2020 by catch - ITA000023241	January		February								March		
	28	30	10	11	12	13	17	18	19	24	5	9	10
Boops boops	0,5	1											
Loligo vulgaris		1	1	0,2	0,5	0,5	0,2	0,8	0,5	0,4	1		
Parapenaeus longirostris													
Merluccius merluccius	0,5		1	0,6	0,5	0,5	0,3	0,8	0,5	0,4	0,5	0,5	0,5
Trachurus spp												0,8	1
Total Kg	1	2	2	0,8	1	1	0,5	1,6	1	0,8	1,5	1,3	1,5

2020 by catch - ITA000006620	January			February							
	28	29	30	10	12	17	18	19	20	24	26
Boops boops	1	1	0,5								
Loligo vulgaris	1	2	0,4	0,475	1	1	1,5	0,22	0,325	1	0,4
Parapenaeus longirostris											
Merluccius merluccius				0,4	0,7	0,4	0,5	0,5	0,5	0,6	
Trachurus spp											
Total Kg	2	3	0,9	0,875	1,7	1,4	2	0,72	0,825	1,6	0,4

2020 by catch - ITA000006529	Jan	February				March		April		May
	30	13	17	18	19	9	10	27	28	5
Boops boops	1							1		1
Loligo vulgaris	1	1	1	1	0,5	1,35	1		0,25	
Parapenaeus longirostris										

Merluccius merluccius		0,7	0,5	1,35	0,5			0,3		1
Trachurus spp						0,5	0,5		0,75	
Total Kg	2	1,7	1,5	2,35	1	1,85	1,5	1,3	1	2

2020 by catch - ITA000018665	January		February						May
	29	30	13	17	18	19	24	5	
Boops boops	0,5	1							0,5
Loligo vulgaris	1	0,5	1	1	1,5	1	1		
Parapenaeus longirostris									
Merluccius merluccius			1	0,5	0,5	1	2		
Trachurus spp									0,5
Total Kg	1,5	1,5	2	1,5	2	2	3	1	

2020 by catch - ITA000006671	Jan	February
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	30	12	13	17	18	19	24
Boops boops	1						
Loligo vulgaris		1,25	1	1	2	1	1
Parapenaeus longirostris							
Merluccius merluccius	1	1	0,5	1,5	1	0,5	1
Trachurus spp							
Total Kg	2	2,25	1,5	2,5	3	1,5	2

2020 by catch - ITA000006657																Mar	April		May			
	January	14	15	28	29	30	February	10	11	12	13	17	18	19	24	26	19	14	20	5	6	13
Boops boops	1	1,25	0,5	1													1			2	0,4	0,
Loligo vulgaris	2	0,5	0,6	1	0,5	0,48	0,25	0,75	0,5	0,5	0,25	1	0,25	0,5			1	1				
Parapenaeus longirostris																						
Merluccius merluccius					0,5	1	0,9	0,25	1	1	0,5	1	0,25	0,5	1				1	0,4	0,	
Trachurus spp																	0,9	1,5				

Total Kg	3	1,75	1,1	2	1	1,48	1,15	1	1,5	1,5	0,75	2	0,5	1	2	1,9	2,5	3	0,8	1,
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2020 by catch - ITA000006462	February				March		
	10	11	12	13	9	10	11
Boops boops							
Loligo vulgaris	0,5	0,5	0,4	0,5			
Parapenaeus longirostris							
Merluccius merluccius	0,5	0,5	0,5	0,5	0,3	0,3	1
Trachurus spp					0,3	1	2
Total Kg	1	1	0,9	1	0,6	1,3	3

2020 by catch - ITA000006542	January		Feb
	14	15	19
Boops boops	1	1	

Loligo vulgaris	2	2	
Parapenaeus longirostris			
Merluccius merluccius			0,5
Trachurus spp			
Total Kg	3	3	0,5

2020 by catch - ITA000026070	January				February							March			
	8	9	29	30	9	10	11	12	13	18	26	3	4	5	10
Boops boops	0,5	2	1	0,5						0,5					
Loligo vulgaris	0,5	1	0,5	0,5	1	1	1	1	1	0,5	1				
Parapenaeus longirostris															
Merluccius merluccius					0,5	1	1	1	1		2	1	1	0,5	1
Trachurus spp												1,5	1,5	0,5	1
Total Kg	1	3	1,5	1	1,5	2	2	2	2	1	3	2,5	2,5	1	2

2020 by catch - ITA000006628	January			February		March			April		
	28	29	30	10	13	9	10	11	7	8	14
Boops boops	1	1,5	1								
Loligo vulgaris	1	1	1	0	1,5				0,8	0,8	0,25
Parapenaeus longirostris											
Merluccius merluccius				1	0,5	0,3	0,3	0,5			
Trachurus spp						0,3	0,4	0,5	0,8	0,5	0,25
Total Kg	2	2,5	2	1	2	0,6	0,7	1	1,6	1,3	0,25

2020 by catch - ITA000025313	Feb	March			April			
	13	3	9	10	14	20	27	28
Boops boops								
Loligo vulgaris	1				0,25	1	0,5	0,3
Parapenaeus longirostris								

Merluccius merluccius	0,5		0,4	0,4				
Trachurus spp		0,3	0,5	0,4	0,25	1	0,5	0,3
Total Kg	1,5	0,3	0,9	0,8	0,5	2	1	0,6

2020 by catch - ITA000024693	January			February								March			
	28	29	30	10	11	12	13	17	18	19	24	2	3	5	9
Boops boops	1	0,5	0,5												
Loligo vulgaris	1	1	1	1	1,5	0,5	1,5	0,5	1	1	1		0,5		
Parapenaeus longirostris															
Merluccius merluccius				1	1	0,5	1	0,5	2	1	1	1	0,5	1	0,5
Trachurus spp												0,5		1	0,5
Total Kg	2	1,5	1,5	2	2,5	1	2,5	1	3	2	2	1,5	1	2	1

2020 by catch - ITA000006464	January	February	Mar
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	14	15	30	12	13	17	18	19	24	9
Boops boops	3	2	1							
Loligo vulgaris	2,5	1	1	0,95	1,2	0,825	1,5	2		1
Parapenaeus longirostris										
Merluccius merluccius				1,5	1,2	0,825	1	0,6	1	
Trachurus spp										1
Total Kg	5,5	3	2	1,5	2,4	1,65	2,5	2,6	1	2

2020 by catch - ITA000006684	January			February					
	28	29	30	11	12	13	17	18	19
Boops boops	0,5	1,5	0,6						
Loligo vulgaris	1	1,5	1	0,8	0,7	1,15	0,8	0,5	1,5
Parapenaeus longirostris									
Merluccius merluccius				0,5	1,5	0,75	0,5	1,05	0,5
Trachurus spp									

Total Kg	1,5	3	1,6	1,3	2,2	1,9	1,3	1,55	2
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2020 by catch - ITA000006700	January		
	7	8	9
Boops boops	2	2	5
Loligo vulgaris			3
Parapenaeus longirostris	1	2,65	
Merluccius merluccius	2,5	2	
Trachurus spp			
Total Kg	5,5	6,65	8

2020 by catch - ITA000019042	February								March			May
	10	12	13	17	18	19	24	26	5	9	10	13
Boops boops												0,25

Loligo vulgaris		1	1	0,5	1	0,5	0,5	0,15				
Parapenaeus longirostris												
Merluccius merluccius	0,5		0,5	0,5	0,5	0,5	0,25	0,2	0,5	0,75	1	0,25
Trachurus spp									0,5	1	0,5	
Total Kg	0,5	1	1,5	1	1,5	1	0,75	0,35	1	1,75	1,5	0,5

2020 by catch - ITA000006696	January			February								March		April				
	28	29	30	10	11	12	17	18	19	24	26	3	5	6	7	14	27	28
Boops boops	0,25	1	0,5															
Loligo vulgaris	0,25		0,5	0,5	0,5	0,5	0,25	1	0,5	0,7	0,2			0,5	1,5	1,5	0,9	0,25
Parapenaeus longirostris																		
Merluccius merluccius		0,5		0,8	0,8	0,5	0,25	1	0,5	0,3	0,2		0,5					
Trachurus spp												0,3	0,5	0,8	1,5	1,5	0,5	0,25
Total Kg	0,5	1	1	1,3	1,3	1	0,5	2	1	1	0,4	0,3	1	1,3	3	3	1,4	0,5

Annex 4

By catch species composition (Kg) campaign 2022

date	other sp	Trachurus spp	Boops boops	Mullidae	Alloteuthis	Trisopterus minutus	Mugilidae	tot by catch
21/02/2022	1	1					1	3
01/03/2022			1	3,5		2,2		6,7
02/03/2022			3,2	2,7	1,1	1,2		8,2
03/03/2022			1,3	3,7	1,1	2,6		8,7
16/03/2022	1	1	3	7,4	2,2	1		15,6
17/03/2022	2		1,6	4	1,5	1,75	1	11,85
21/03/2022	21		1	3	0,5	1	1,5	28
22/03/2022	21,5	0,5	1	4,3	2,8	0,9	1,3	32,3
23/03/2022	1	0,8	1,8	3	1,3		1,8	9,7
24/03/2022	2	0,8	1,9		1,8	2,8	1	10,3
28/03/2022	1,5	0,8	2,3	4,4	2,6	3,5	1	16,1
29/03/2022			4,3	7	3,4	3,2		17,9
30/03/2022	2		3,3	8,2	2,2	3	1	19,7
04/04/2022	0,5		2	4,5	1,9	1,6		10,5
05/04/2022	1,5		3,5	5,8	1,1	1		12,9
06/04/2022	2	1	3	9	3,2	3,8	1,5	23,5
07/04/2022	1		2	3	2	1,5	1	10,5
12/04/2022			2,9	6,1	0,5	4	1	14,5
13/04/2022	2		2,5	3		1		8,5
14/04/2022	2	1		2,7	0,5		0,5	6,7
19/04/2022	1,5			1				2,5
26/04/2022				1		1		2
27/04/2022			1	1		2		4

02/05/2022		0,9	2,7	2,2	0,5	0,7	3,5	10,5
03/05/2022		1	2,4		0,3	2,4	3	9,1
05/05/2022		0,5		1			0,9	2,4
09/05/2022			1	1,2		0,5	1	3,7
11/05/2022		1	0,4				0,4	1,8
16/05/2022				0,5		0,5		1
17/05/2022		0,4						0,4

Annex 5

By catch species composition (Kg) campaign 2022 - 2023

date	other sp	Trachurus spp	Boops boops	Mullidae	Alloteuthis	Trisoptus minutus	Mugilidae	tot by catch
05/12/2022				0,5				0,5
06/12/2022		3	1					4
07/12/2022	9	5						14
12/12/2022	2	17,5	9,5	11	7		1,5	48,5
13/12/2022	6	13,5	14	6	2			41,5
14/12/2022		6	6	12				24
15/12/2022	1,5	10,5	8,5	6,5				27
19/12/2022		26	33,5	16,5				76
20/12/2022	8,5	25	28	24		1	0,5	87
21/12/2022	4	17,8	15,5	12,2				49,5
22/12/2022	1	8,2	5					14,2
27/12/2022	3	11	12	3,5	0,5	1,9	1	32,9
28/12/2022		26	35	20				81

29/12/2022		2	5	2				9
02/01/2023	2	19	30	24				75
03/01/2023	5	30,8	59,7	31	1	0,7	0,8	129
04/01/2023			4	2	6			12
05/01/2023		2	2	2	1			7
09/01/2023	17,5	40	42	50,3		1,5	1,7	153
11/01/2023	1,5	1,5	1,5	1	8			13,5
12/01/2023	8,5	6	17,5	10	1	1		44
16/01/2023	9,5	16,5	36	29,3	1,5		1,4	94,2
17/01/2023	0,5	12,7	24,5	15,3	5			58
18/01/2023		2,5	5,5	9,2	1			18,2
19/01/2023		7	7,5	19	8,5			42
23/01/2023	7	8,7	4	10,8	7			37,5
24/01/2023	16,5	14	16,5	14				61
25/01/2023	6,5	11	19,5	18,4	7			62,4
30/01/2023	6,5	14	48	40	10		1	119,5
31/01/2023	2	22	30	22,5	9		1,5	87

01/02/2023	11,5	42	37,5	38,5	5		3	137,5
02/02/2023		18	0,5	15	0,5			34
13/02/2023	3	5,5	8	7				23,5
14/02/2023	4	10,5	9	13,5	2			39
15/02/2023	6,5	7,5	7	16,5	4,5			42
16/02/2023	4	8,5	12	9	2	1	1	37,5
20/02/2023	3,5	7,1	11,4	17	2,5	0,5		42
21/02/2023		8,5	9,5	13	2,3			33,3
22/02/2023	3	7	9,5	12	1			32,5
23/02/2023	2	3	14,5	12,9	1			33,4
27/02/2023	2	10,5	7,2	11	0,5			31,2
28/02/2023	4	13	13,5	19,5	3			53
01/03/2023	3	4,2	2,5	4,7	0,5	0,8		15,7
02/03/2023	3	10	4,5	18,7	3,8			40
06/03/2023	1	9,5	7,5	1,7	3,5	2,3	1	26,5
07/03/2023	1,5	29,2	8,5	15	3,4	10	5	72,6
08/03/2023	1	17,8	10,5	20,5	0,6	1,5		51,9

09/03/2023	1	18	2,5	17	0,5			39
13/03/2023	3	13,5	15	6,5	2		9	49
14/03/2023	7	12,5	7	6	3	5		40,5
20/03/2023	2	6	12	7,5	6		3	36,5
21/03/2023	10	14,5	22,5	25,5	5	2		79,5
22/03/2023		19,5	19	10	19		1	68,5
23/03/2023		15,5	29	17	17,5	2		81
29/03/2023	5	10,5	5,5	6,5	10,5	5	5	48
30/03/2023	16	14	16	26	15		2	89
03/04/2023		0,5	0,5	1				2
05/04/2023		1	0,5	0,5				2
06/04/2023		0,5	0,5	0,5	0,5			2
12/04/2023	5	5	5	4	4	14	2	39
13/04/2023	12	11	5	8	7	10	5	58
18/04/2023	3	2		4,5	1	3	4	17,5
19/04/2023	9,5	3		7,5	1	17		38
20/04/2023	1,7	5	2	8,5	6	20,5		43,7

08/05/2023	6	11	4	21	5	3	5	55
09/05/2023	6	3	2	7	5			23

Annex 6

By catch species composition (Kg) campaign 2023 - 2024

Date	other sp	Trachurus spp	Boops boops	Mullidae	Allotheuthis	tot by catch
13/11/23	18	5		95	12	130
14/11/23	11	32	23	71	7,5	144,35
15/11/23	15	19		59,5	9	102,5
16/11/23	21	19	3	47	3	93
20/11/23	16	26	14	78	12	146
21/11/23	24	20	2	74	1,5	121,5
22/11/23	3	10		51	2	66
27/11/23				24		24
29/11/23	4	2		29	2	37
30/11/23		16		27	11	54
04/12/23	8	2		20	9	39
05/12/23		6		29	9,1	44,1
06/12/23		4		50	5	59
07/12/23				10	6	16
11/12/23		10	5	40	5	60
12/12/23	7	19	1	57	7	91
13/12/23	20	2	8	47	2	79
14/12/23		3		24	1	28
18/12/23		2		16		18
19/12/23		1		13	3	17

20/12/23	4	20		37	4	65
21/12/23		12	3	29	6	50
27/12/23	15	20	5	81	9	130
28/12/23	5	8		69	8	90
02/01/24	6	9		42	5	62
03/01/24		9		47	25	81
08/01/24		5	1	36	7	49
09/01/24		9		15	4	28
10/01/24				17	4	22
11/01/24	2	4		6	3	15
15/01/24		9	1	48	3	61
16/01/24		14		53	6	73
17/01/24	5	8		51	7,6	71,6
18/01/24				1		1
22/01/24				1,5		1,5
23/01/24				21	2	23
24/01/24	4	9	7	22	2	44
25/01/24	6	19	11	46	10	92
29/01/24		11		93,5	7	111,5
30/01/24	1	11	2	76	20	110
31/01/24		6		55	19	80
01/02/24	1	4		45,7	18	68,7
12/02/24				5	1	6
13/02/24				4	1	5
14/02/24				7	4	11
19/02/24	25	4		30	5	64
20/02/24	10	26		36	9	81
21/02/24	5	7	5	35	6	58
22/02/24		15		33	9	57

26/02/24		7	4	21	9	41
27/02/24	1			5	2	8
04/03/24				1		1
06/03/24	15	7		10	2	34
13/03/24				5		5
14/03/24	5		5	20		30
18/03/24	3	20	5	30		58
19/03/24	10	5	20	20	2	57
20/03/24	2	12	10	25	3	52
21/03/24		10	2	20	2	34
25/03/24	4	3		13	3	23
03/04/24		8		10		18
04/04/24	10	5		15	6	36
08/04/24		10		35	2	47
09/04/24		10		20		30
10/04/24	15	5		10	5	35
11/04/24		15		15	3	33
15/04/24		5		35	6	46
16/04/24					3	3
22/04/24		8		19	2	29
23/04/24		2		5	3	10
30/04/24				20		20