

## Current state of small-scale fisheries in Emilia-Romagna

**“Provision of two socio-economic and statistical studies on small-scale fisheries (WP3) for the project called 'Adri.Smartfish' within the framework of the Programme Interreg V-A Italy-Croatia 2014/2020”. CUP H41C19000000007 - CIG: Z9C2C0DF51”**

### WP3 Evaluation of the Small-Scale Fishery sector D3.2 Evaluation of the ecological sustainability of SSF

August / 2020

## 1. Introduction

It should be immediately pointed out that this work will focus on "small-scale fisheries - SSF", the fishing activity carried out by vessels with a professional fishing licence and measuring less than 12 metres in length (LOA – Length overall), using fixed, non-towed gears, i.e.: gillnets, trammel nets, fyke nets, pots and baskets. In regulatory terms, however, more details will be given below.

Figure 1 shows a "standard vessel". Almost all of these vessels are planing motorboats between 7 and 9 metres in length, equipped with electronic navigational instruments, tools for retrieving nets and baskets and possibly sorting tools for snails (*Nassarius mutabilis*) or tools for putting gillnets in order.



Figure 1 – Standard vessel, used in SSF activities in Emilia-Romagna

The region in study, Emilia-Romagna, has an entirely sandy coast, about 130 kilometres long, starting in the north at the the mouth of the river Po di Goro (FE), until the mouth of the Tavollo torrent, that is the canal port of Cattolica (RN), in the south.

There are four coastal provinces: Ferrara, Ravenna, Forlì-Cesena and Rimini, going from north to south. The maritime compartment of Ravenna includes the coastal stretches of the two northern provinces, while Rimini compartment contains the two southern ones. The marine waters are naturally eutrophic, thanks to freshwater river nutrients and shallow seabed depths. Historically the fishing activity is very developed, with vessels moored in the nine main harbors of Ravenna: Goro, Porto Garibaldi, Ravenna, Cervia, Cesenatico, Bellaria, Rimini (Figure 2), Riccione and Cattolica. Regarding the small-scale fishing fleet, few dozen vessels are as well kept along the beach or in smaller harbours: Gorino, the mouths of the northern rivers, Viserba, Portoverde, etc.

It should be pointed out that even the smallest vessels with a “Pesca costiera locale” (Local Coastal Fishing) licence can operate in the compartment of registration as well as in the neighbouring one. Therefore, in the north, the vessels registered in the Ravenna ports can also fish in the Chioggia maritime compartment, while in the south, those registered in the Rimini compartment can also fish in the Pesaro one. An area extension that reciprocally concerns the vessels registered in the compartments of Pesaro and Chioggia, which can therefore fish in the south and north of Emilia-Romagna respectively.



Figure 2 - SSF vessels in Rimini

In Italy, the Ministerial Decree of 7 December 2016 "Disciplina della piccola pesca e della piccola pesca artigianale" is the national benchmarking law of this sector. "Artisanal small-scale fishing" is defined as the "fishing activity carried out by units of less than 12 metres overall length, authorised to carry out local coastal fishing (within 12 nautical miles from the coast) with one or more of the following systems and/or fishing gear, associated with the relevant international codes:

- Set gillnets (anchored) - GNS
- Encircling gillnets - GNC
- Trammel nets - GTR
- Combined gillnets - trammel nets - GTN
- Pots - FPO
- Fyke nets - FYK
- Handlines and hand-operated pole-and-lines - LHP
- Mechanized lines and pole-and-lines - LHM
- Trolling lines - LTL
- Harpoons - HAR

While the term "small-scale fishing" refers to "artisanal small-scale fishing" together with the fisheries carried out by units of less than 12 metres overall length, licensed to exercise local coastal fishing (within 12 miles of the coast) with one or more of the following fishing systems and/or gear:

- Drift gillnets - GND
- Set longlines - LLS

Specifically in Emilia-Romagna these last two types of gear are not used, while it is to mention the presence of 7/8 vessels practicing fishing with gillnets and have a length of just over 12 metres, those are commonly considered to be part of artisanal small-scale fisheries.

The same decree renews the terms of the constitution and functions of the "Consorti di gestione tra imprese della piccola pesca artigianale" (management consortia of artisanal small-scale fishing enterprises), which would be entrusted with the management, on a compartmental basis, of "artisanal small-scale fishing" activities carried out within 6 nautical miles from the coast. More information are to be found in the aforementioned decree, however, it is specified that the consortia must include "a number of members representing at least 75% of the enterprises involved in "small-scale artisanal fishing" in the Maritime Department where the Consortium is to be established".

Equally important for a general framework is the "Action Plan for the development, competitiveness and sustainability of small-scale coastal fishing, in accordance with the REG. (EC) 508/2014 art.18, paragraph 1, letter i".

Finally, again from a regulatory point of view, it should be remembered that small-scale artisanal fishing is regulated, with special decree from the responsible Port Authority Office, also at a compartmental level, specifically for marine snail (*Nassarius mutabilis*) and cuttlefish (*Sepia officinalis*) fishing.

## 2. Characterisation of small-scale artisanal fishing in the regional area, in terms of ports, number and characteristics of vessels

Before characterising small-scale artisanal fishing fleet, a brief and more general updated picture on professional fishing in Emilia-Romagna is presented, obtained by processing data from the Fleet Register of the European Union (Table 1).

In numerical terms the most important port is Goro, with 246 vessels with a fishing licence. It should be pointed out, however, that many of them are not used for fishing, but for clam (*Ruditapes philippinarum*) harvesting, which means they hold a “V° category” license classifying them as “unità asservite ad impianto di molluschicoltura” (vessels permanently assigned to the service of mussel farming facilities). If, on the other hand, the total engine power is taken into consideration, the most important fleet belongs to Rimini, which is composed by 80 vessels for a total of 13,566.81 kW. The most significant share is still attributable to trawling fisheries, followed by hydraulic dredging and small-scale artisanal fishing. Table 2 summarises the technical characteristics of the fleet divided by “first gear” in use, while provides details specifically on small-scale artisanal fishing gears. Figure 3 shows the age classes of the vessels enlisted in the ports of Emilia-Romagna in 2020 using the year of their construction through the data available in the Fleet Register EU. As can be seen, the fleet is composed by more than half of the vessels (57%) built from 1980 to 1999 while only 24% of the fleet has 20 years of service or less.

Even without going further into the description of the technical characteristics of the regional fleet, it should be noted that the last thirty years have seen a drop in the number of vessels, as shown in Figure 4 and Figure 5. Numerically, there has been a reduction of 48%, while comparing the overall engine power, the reduction has been around 44%. This fall can be attributed, on the one hand, to the European Union's policy of reducing fishing effort and, on the other, to a drastic reduction in profitability, linked to the reduced availability of resources, higher fuel prices and higher expenditure. However, it should make one think the fact that the drastic reduction in fishing effort has not resulted in any

improvement in terms of landings, either in absolute values (Figure 6), or even a greater reduction in effort in percentage terms (- 60%), or in relative values.

Table 1 - The Emilia-Romagna fishing fleet, divided by port of registration - 2020 (source: Fleet Register UE)

Port	Serial number	N°	LOA			Kw			WE*	Year of construction		
			Avg	Min	Max	Avg	Min	Max	N°	Avg	Min	Max
Ravenna	00RA	20	8,5	5,9	16,8	139,2	18,0	368,0	5	2000	1981	2015
Porto Garibaldi	01RA	56	12,8	4,9	25,2	159,6	16,8	735,0	2	1990	1965	2004
Cervia	02RA	37	9,7	4,4	15,7	98,3	14,5	218,0	4	1994	1950	2015
Goro	05RA	245	8,4	4,5	21,0	73,3	5,8	373,0	69	1986	1910	2017
Rimini	00RM	80	13,0	4,1	26,7	178,5	5,9	835,0	4	1991	1968	2012
Cattolica	03RM	41	10,8	4,1	22,3	95,7	8,8	220,0	6	1996	1959	2014
Cesenatico	04RM	45	12,6	6,2	23,4	171,1	14,0	518,0	1	1992	1960	2013
Riccione	07RM	23	7,2	4,7	16,8	49,7	14,7	208,8	7	1984	1947	2003
Bellaria	08RM	35	8,7	4,1	15,6	90,8	3,2	275,7	3	1985	1913	2017
	Total	582	10,0	4,1	26,7	114,3	3,2	835,0	101	1989	1910	2017

Note: (\*)WE stands for "Without Engine" vessels.

Table 2 Main gears of the Emilia-Romagna fishing fleet, divided by port of registration; 2020 (source: EU Fleet Register)

Port	Serial number	Fleet		SSF Gears				Other fishing techniques gears			
		Total	SSF	PS	GND	GNS	LLS	OTB	DRB	PTM	TBB
Ravenna	00RA	20	19	0	1	10	8	1	0	0	0
Porto Garibaldi	01RA	56	17	2	0	11	4	38	0	1	0
Cervia	02RA	37	23	0	0	14	9	3	11	0	0
Goro	05RA	245	171	1	0	129	41	64	7	0	3
Rimini	00RM	80	37	1	0	6	30	31	12	0	0
Cattolica	03RM	41	22	0	0	11	11	6	13	0	0
Cesenatico	04RM	45	19	6	0	5	8	24	2	0	0
Riccione	07RM	23	19	1	0	12	6	1	3	0	0
Bellaria	08RM	35	25	1	0	11	13	4	6	0	0
	Total	582	352	12	1	209	130	172	54	1	3

Table 3 - Details of the mains gear of the small-scale fishing fleet in Emilia-Romagna, 2020 (source: Fleet Register UE)

Port	Serial number	SSF fleet	SSF fishing gears			
			PS	GND	GNS	LLS
Ravenna	00RA	19	0	1	10	8
Porto Garibaldi	01RA	17	2	0	11	4
Cervia	02RA	23	0	0	14	9
Goro	05RA	171	1	0	129	41
Rimini	00RM	37	1	0	6	30
Cattolica	03RM	22	0	0	11	11
Cesenatico	04RM	19	6	0	5	8
Riccione	07RM	19	1	0	12	6
Bellaria	08RM	25	1	0	11	13
	Total	352	12	1	209	130

Table 4 – Fishing gear codes (source: Fleet Register UE)

GEAR CODE	Meaning
DRB	Towed dredges
OTB	Otter trawls
PTM	Pair trawls
TBB	Beam trawls
GND	Driftnets
GNS	Set gillnets (anchored)
LLS	Set longlines
PS	Purse seines
FPO	Pots
FYK	Fyke nets



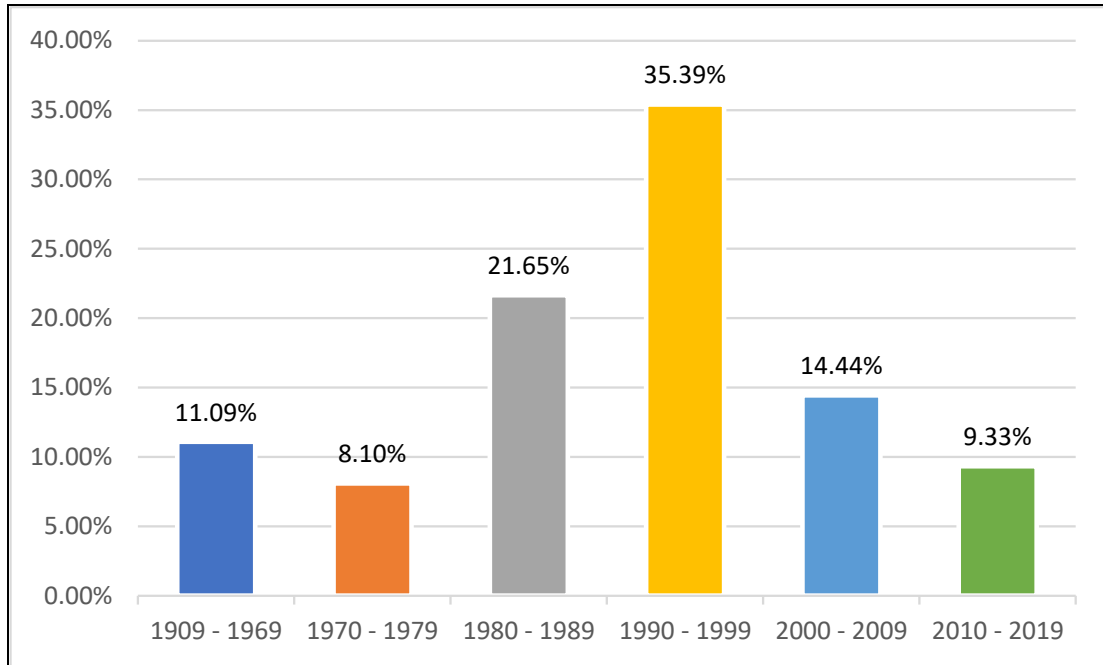


Figure 3 - Time distribution of the year of construction of fishing fleet in service in Emilia-Romagna, 2020 (source: EU Fleet Register)

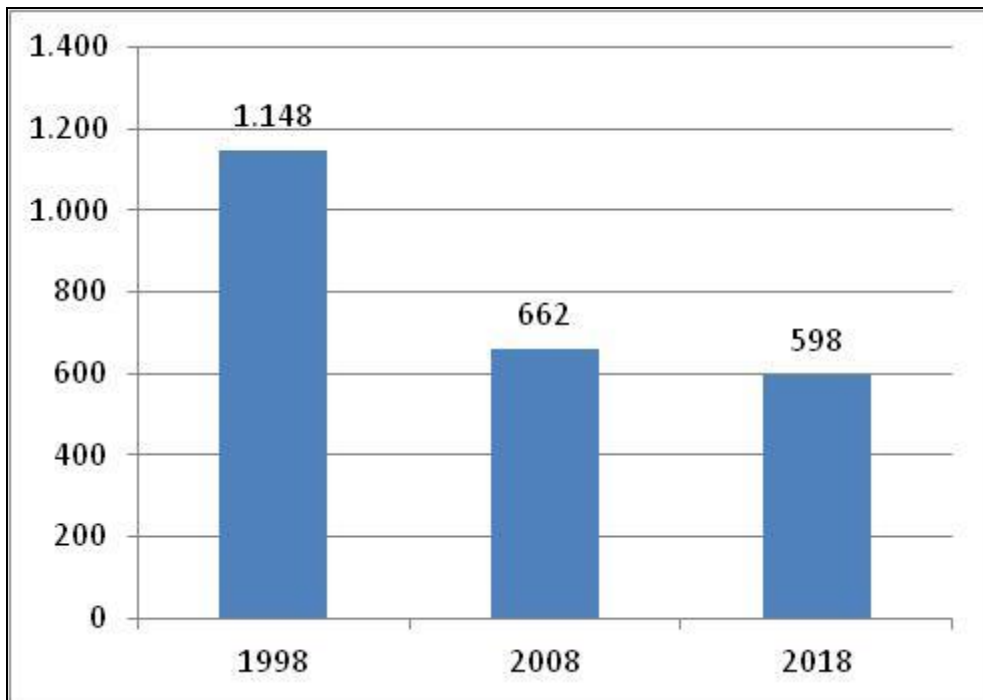


Figure 4 - Evolution of the fishing fleet in Emilia-Romagna, in numerical terms (n) (M.A.R.E. Scarl elaboration)

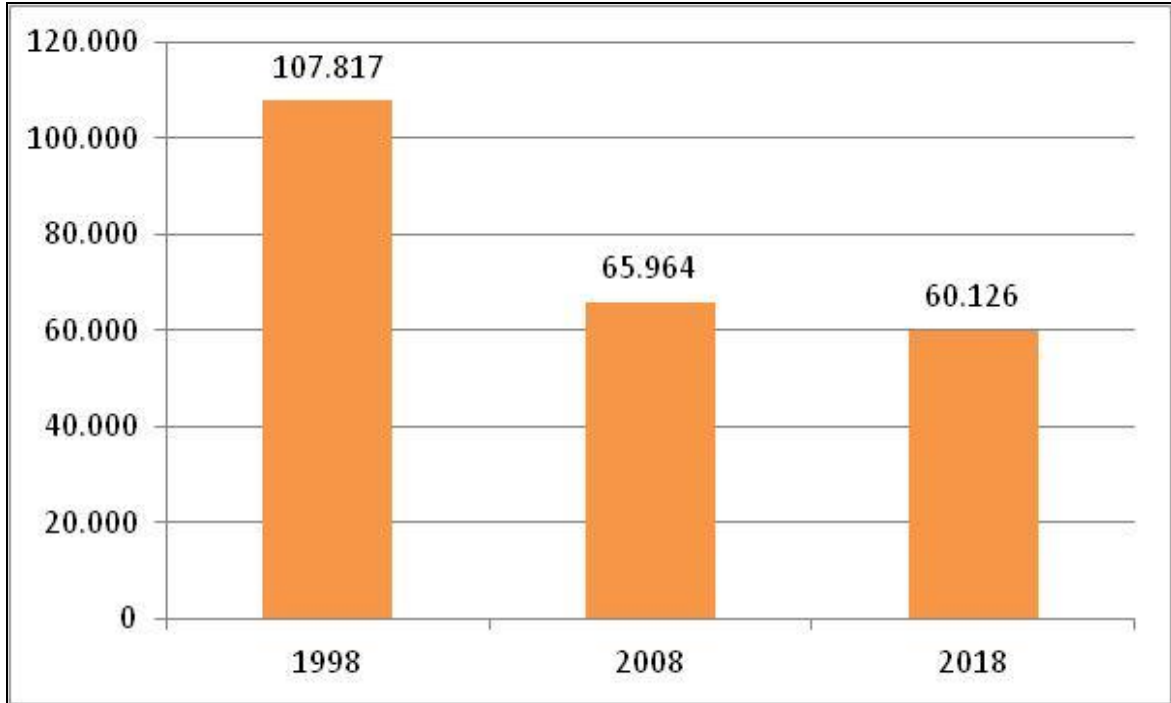


Figure 5 - Evolution of the fishing fleet in Emilia-Romagna, in terms of engine power (kW) (M.A.R.E. Scarl elaboration)

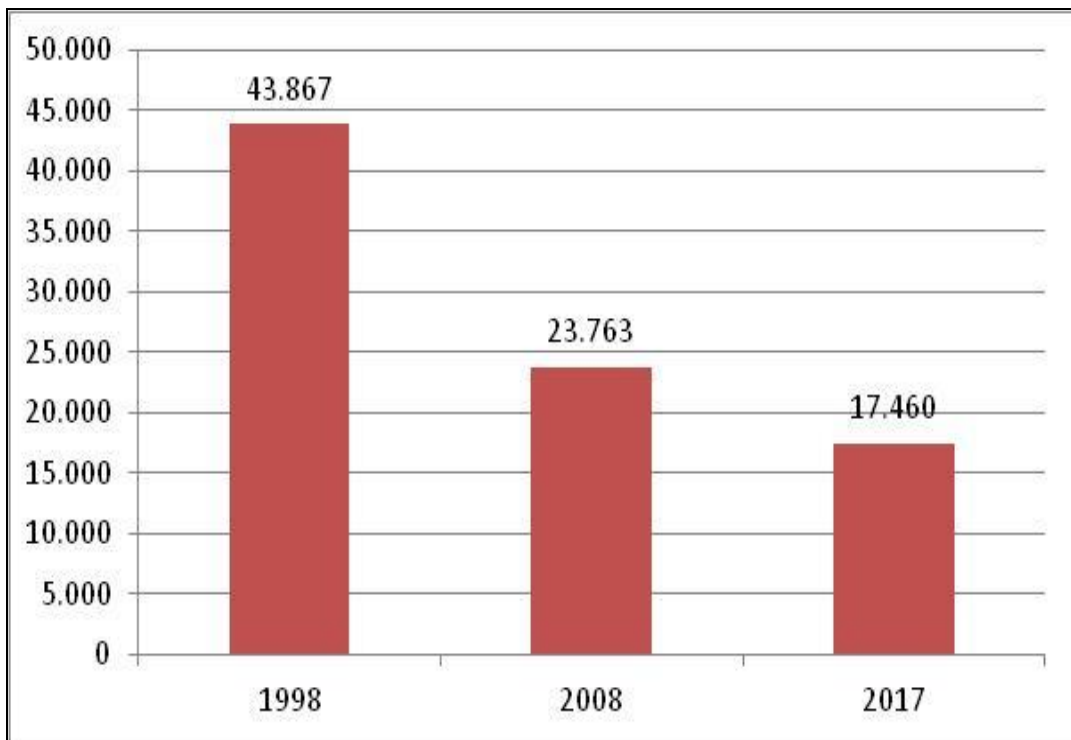


Figure 6 - Evolution of landed product (t) in Emilia-Romagna (M.A.R.E. Scarl elaboration)

In this general economically negative context, small-scale artisanal fishing has shown at least a certain kind of dynamism, in terms of fleet renewal, types of fishing activities, demographic and economic aspects, which we will address in the following chapters.

Following now to the characterisation of small-scale fishing, Table 5 presents the aggregated data from the Fleet Register. Table 6 also shows the vessels registered in the Local Maritime Office of Gabicce (3PS), because most of them moors in the Cattolica dock and contribute to the activities of the Romagna seafood industry.

Table 5 - The small-scale fishing fleet of Emilia-Romagna, 2020 (source: Fleet Register UE)

Port	Serial number	N°	LOA			Kw			WE*	Year of construction		
			Avg	Min	Max	Avg	Min	Max	N°	Avg	Min	Max
Ravenna	00RA	19	8,3	5,9	16,8	136,0	18,0	368,0	5,0	2000	1991	2015
Porto Garibaldi	01RA	17	9,5	4,9	15,0	135,6	16,8	323,2	2,0	1996	1984	2002
Cervia	02RA	23	7,5	4,4	12,0	84,1	14,5	218,0	4,0	1997	1950	2015
Goro	05RA	171	6,8	4,5	10,8	42,3	5,8	184,5	69,0	1985	1910	2017
Rimini	00RM	37	6,6	4,1	12,6	65,9	5,9	177,6	4,0	1989	1968	2010
Cattolica	03RM	22	7,8	4,1	11,4	67,0	8,8	147,1	6,0	1999	1977	2014
Cesenatico	04RM	19	8,7	6,2	22,6	108,2	14,0	518,0	1,0	1996	1973	2010
Goro	05RA	171	6,8	4,5	10,8	42,3	5,8	184,5	69,0	1985	1910	2017
Riccione	07RM	19	6,1	4,7	9,8	39,2	14,7	208,8	7,0	1986	1970	2003
Bellaria	08RM	25	6,9	4,1	14,8	76,7	3,2	275,7	3,0	1984	1913	2017
	Total	352	7,2	4,1	22,6	68,5	3,2	518,0	101,0	1989	1910	2017

Note: (\*)WE stands for "Without Engine" vessels.

While this is an up-to-date picture of the official data concerning small-scale artisanal fishing, it should be noted that fewer vessels are actually active, especially in the northern part of the region. Table 6 compares the official data from the EU Fleet Register in 2020 with those from a census conducted in 2018, the full details of which are given in Table 8

While Table 7 provides a detailed picture of the census carried out, which shows that vessels (21% of the total) also hold a "unit in use in aquaculture facility" licence, almost all of them registered in Goro, as previously mentioned. In fact, it should be noted that vessels with III° category "pesca costiera ravvicinata" (close coastal fishing) and IV° category "pesca costiera locale" (local coastal fishing) licences can also have a V°

category “unità asservita ad impianto” (vessels permanently assigned to the service of fishing facilities) licence. In fact, art. 1 DM 29 September 1995 provides that "Vessels already licensed to carry out coastal (close - local) fishing activity may, at the request of the interested party, be authorized to carry out fishing activity in an aquaculture facility". Table 8 shows instead the technical characteristics of the artisanal small scale fishing fleet updated with the census data.

Figure 7 compares the age of artisanal small-scale fishing vessels. It can be seen that also for the artisanal small-scale fishing fleet, as for fishing fleet in general, the 1990s are the period that has scored the largest number of new vessel constructions. But unlike the other types, the constructions that took place in the following twenty years are also significant, with 21% of the vessels built in the decade 2000-2009 and 15% built in the last decade. Compared to the entire fishing fleet in Emilia-Romagna, the small-scale fishing fleet is therefore younger, with 36% less than 20 years old, compared to only 23% of the entire fleet. The difference is much more highlighted if one compares the artisanal SSF to the rest of the fleet (hydraulic dredges, pelagic and bottom trawlers and dredges), the latter aggregated categories in fact, despite having more than a third of the fleet built in the 1990s, have only 17.4% with twenty years or less against 36% of the small-scale fishing fleet mentioned above.

Table 6 - Comparison between the official data of the small-scale fishing fleet in Emilia-Romagna from Fleet Register (2020) and the actual data obtained through the carried out census (2018)

Port	Serial number	Emilia-Romagna fishing fleet (Fleet Reg. 2020)	Emilia-Romagna SSF fleet (Fleet Reg. 2020)	Emilia-Romagna SSF fleet (Census 2018)	Difference %
Ravenna	00RA	20	19	12	63%
Porto Garibaldi	01RA	56	17	11	65%
Cervia	02RA	37	23	21	91%
Goro	05RA	245	171	78	46%
Rimini	00RM	80	37	28	76%
Cattolica	03RM	41	22	23	105%
Cesenatico	04RM	45	19	13	68%
Riccione	07RM	23	19	15	79%
Bellaria	08RM	35	25	11	44%
Total E-R		582	352	212	60%
Gabicce Mare	3PS	44	17	12	71%
Pesaro*	PS			1	
Total		626	369	225	61%

Note: Artisanal SSF (Small Scale Fisheries); for the artisanal SSF in Cattolica and in the other ports there were some vessels (about ten) re-registered a few weeks ago and not yet transcribed with new registration in the Fleet Register.

Table 7 - Result of the census carried out in autumn 2018, concerning the activity of the artisanal SSF vessels officially registered in the EU Fleet Register.

Activity	N°	Year round activity	Seasonal activity
Artisanal SSF	225	163	62
Other fishing activities	10		
Not available	26		
Vessels permanently assigned to the service of mussel farming facilities	79		
Demolished	14		
Sold	11		
Decommissioned	13		
Marine traffic	1		
Sunk	2		
<b>Total</b>	<b>381</b>		

Note: also in this case the difference between the official total figure of 369 vessels (Table 6) and the one reported here of 381 vessels can be attributed to vessels re-registered a few weeks ago and not yet registered in the Fleet Register.

Table 8 - Small-scale artisanal fishing vessels registered in the two maritime compartments Emilia-Romagna (source: census 2018)

Port	Serial number	N°	LOA			Kw			WE*	Year of construction		
			Avg	Min	Max	Avg	Min	Max	N°	Avg	Min	Max
Ravenna	00RA	10	7,1	5,9	8,9	95,9	18,0	150,0	4	2000	1992	2014
Porto Garibaldi	01RA	11	10,0	7,5	13,4	135,3	61,5	295,6	1	1996	1965	2004
Cervia	02RA	18	7,9	5,4	12,0	95,3	14,5	218,0	3	2001	1972	2015
Goro	05RA	78	6,6	4,5	10,8	42,3	9,2	125,0	40	1988	1919	2016
Rimini	00RM	28	7,0	4,1	12,6	66,5	5,9	177,6	1	1990	1972	2010
Cattolica	03RM	22	7,7	4,1	11,4	61,8	8,8	143,4	6	2000	1977	2014
Cesenatico	04RM	13	7,4	6,7	8,5	80,0	39,7	147,0	1	2000	1992	2010
Riccione	07RM	15	6,1	5,0	7,9	25,4	14,7	59,0	5	1984	1968	2000
Bellaria	08RM	11	7,0	5,7	11,2	71,8	25,7	125,0	1	1994	1982	2011
	<b>Total</b>	<b>206</b>	<b>7,1</b>	<b>4,1</b>	<b>13,4</b>	<b>67,2</b>	<b>5,9</b>	<b>295,6</b>	<b>62</b>	<b>1992</b>	<b>1919</b>	<b>2016</b>

Note: (\*)WE stands for "Without Engine" vessels. Data elaboration carried out only on the 206 artisanal SSF vessels present in the Fleet Register with the same serial number found in the census..

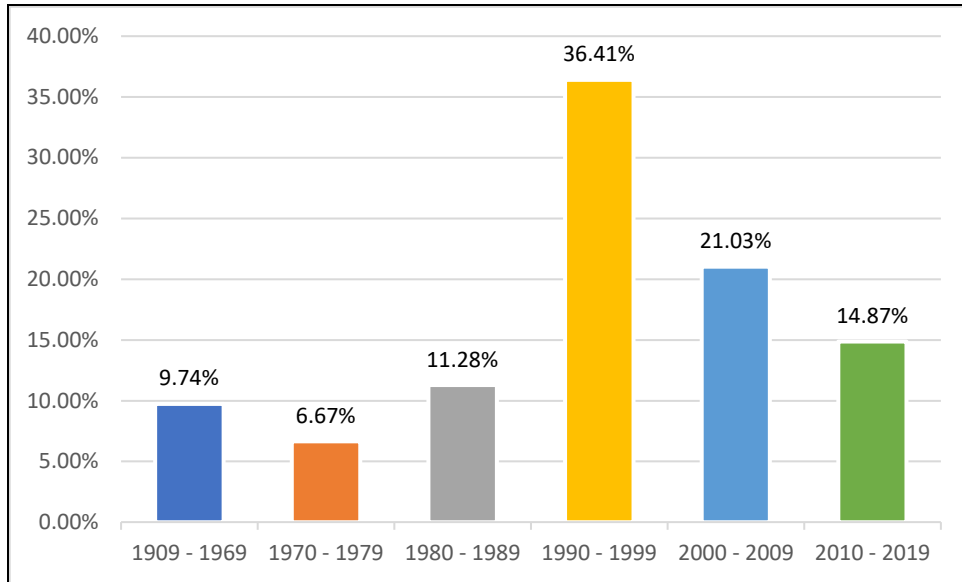


Figure 7 - Time distribution of construction of vessels in the small-scale fishing fleet in Emilia-Romagna  
(source: census 2018)

### 3. Social characterization of small-scale and artisanal fishermen in terms of employed persons, demographic data, turnover and income generated and in terms of identification of fishing strategies.

#### *Employed people and demographic data*

In comparison with 212 vessels with a licence for artisanal small-scale fishing in Emilia-Romagna also 13 vessels from the Marche region based in Cattolica are to be added, it is therefore estimated that about 320 people are employed in the SSF fleet of the region.

Before examining the data collected, it should be made clear that in almost all the vessels the fishermen have a “doppia mansione” (double job). This means that even a single person is allowed to be at sea, holding simultaneously a certified deck title and a certified engineering title therefore performing the duties of both captain and chief engineer, reference of the law in Table 13 and Table 14 . In almost all cases, the person on board is also the owner and shipbuilder.

To characterise small-scale artisanal fishing from a personal details and social point of view, 21 fishermen belonging to the ports of Cervia, Cesenatico, Bellaria-Igea Marina, Rimini, Cattolica were interviewed (Table 9). It should be noted that only men are employed in the field activities, while women (often wives, partners or other family members) carry out activities related to marketing or administration.

Table 9 - Interviewed fishermen's port of activities

Port	Total
Cervia	6
Cesenatico	1
Bellaria-Igea Marina	4
Rimini	3
Cattolica	7
Total	21



Most of the fishermen surveyed were born in areas close to the coast of Emilia-Romagna (Table 10). Only a few were born in other regions, in particular Apulia and Sicily, confirming the existence of an immigration phenomenon from southern Italy. There is also a foreign ship owner/fisherman, born in Albania, but in this sub-sector, unlike the others, foreigners are not numerous. As far as residence is concerned, on the other hand, they all reside in the municipalities of the same ports where the vessel is moored, or in some cases in nearby places, in order to be able to reach the port quickly and easily, even several times during the same day.

Table 10 - Birth region of the interviewed fishermen

Birth region	Total
Emilia-Romagna	13
Lombardia	1
Marche	1
Apulia	3
Sicily	2
Albania	1
Total	21

The average age of the fishermen in our sample is 43 years old; this value reflects the following composition of the sample: 62% are over 40 years old (the oldest is 65), while only 38% are under 40 years old (the youngest is 19). This figure is related to the qualification and professional maritime qualifications acquired during the career. In particular, 71% of the fishermen surveyed have a secondary school diploma, while only 29% have attended and successfully completed secondary school (Figure 8). Age and level of education seem to be linked as older fishermen are also the least educated, while younger fishermen (under 40 years) also have a secondary school diploma. In some cases, age may also be linked to the acquisition of maritime professional qualifications. In this case the relationship is the opposite: the younger fishermen, having less navigation time acquired, do not have access to examinations at the Port Authority Office.

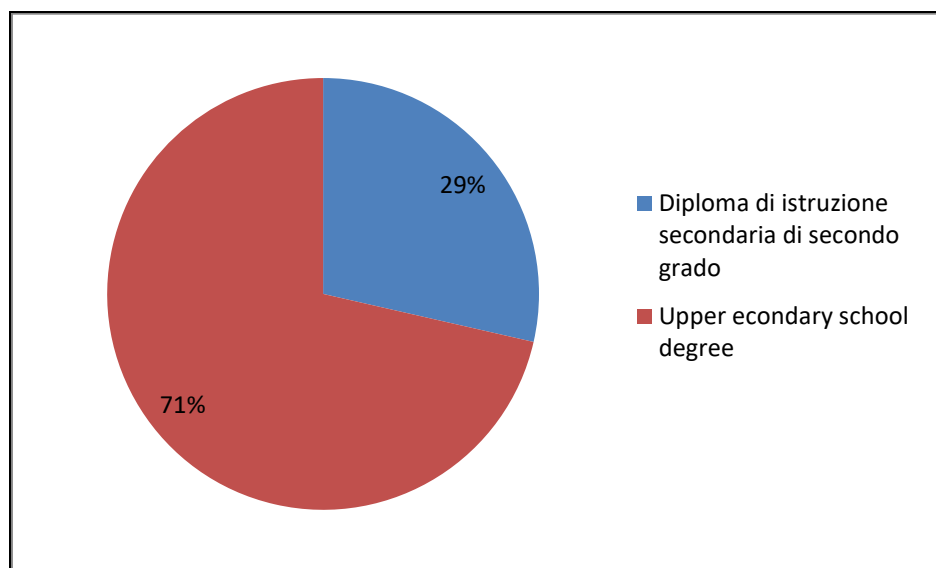


Figure 8 - Educational qualifications held by interviewed fishermen

Table 11 “Titoli di coperta” (deck titles) held by the interviewed fishermen

“Titoli di coperta” (deck titles)	Total
No titles	3
Conduttore per la pesca costiera locale (Local coastal fishing conductor)	4
Capo barca per la pesca costiera (Coastal fishing skipper)	7
Marinaio autorizzato alla pesca (Sailor authorised for fishing)	7
<b>Total</b>	<b>21</b>

Table 12 - Engineering titles held by the interviewed fishermen

“Titoli di macchina” (Engeneering titles)	Total
No titles	5
Marinaio motorista (Motorist sailor)	2
Motorista abilitato (Authorised motorist)	11
Meccanico navale di II classe” (Second class naval mechanic)	3
<b>Total</b>	<b>21</b>

In Table 14, the professional qualifications for “servizi di coperta e di macchina” (deck and engineering duties) are summarised, with reference to the fishing operations, while Figure 9 shows the training courses and the requirements necessary to access the exams and obtain the qualifications.

Table 13 - Minimum qualification needs for small-scale artisanal fishing and other activities (Source: Capitaneria di Rimini, ORD. n. 69/2019 - Modificata dall'Ord. n. 106/2019)

TABELLA MINIMA DI ARMAMENTO PER UNITA' DA PESCA AUTORIZZATE AD ATTIVITA' DI PESCA CON I SISTEMI <u>DIVERSI</u> DALLO "STRASCICO, VOLANTE, DRAGA IDRAULICA E CIRCUZIONE" COMPRESO IL SERVIZIO PRESSO IMPIANTI DI PESCA, ACQUACOLTURA E MOLLUSCHICOLTURA (inferiori ai 24 metri di lunghezza tra le perpendicolari)		
TIPO UNITA'	TOTALE EQUIPAGGIO	QUALIFICHE
Fino a 3,00 TSL a vela non provviste di motore, con vela di superficie complessivamente non superiore, in opera, a 14 mq e /o a remi di lunghezza non superiore a 10 mt (propulsione a remi o a vela)	<b>1</b> marittimo	n° 1 marittimo conduttore in possesso di relativo titolo professionale
M/pesca fino a 6 TSL (entro 6 MN)	<b>2</b> marittimi	n° 1 conduttore e n° 1 marinaio motorista <i>ovvero</i> n° 1 conduttore in possesso anche del titolo di macchina, previa autorizzazione all' imbarco in qualità di comandante autorizzato ad esercitare la duplice funzione <sup>2</sup> .
M/pesca da 6,01 TSL (entro 12 MN)	<b>2</b> marittimi	n° 1 conduttore e n° 1 marinaio motorista <i>ovvero</i> n° 1 conduttore in possesso anche del titolo di macchina, previa autorizzazione all' imbarco in qualità di comandante autorizzato ad esercitare la duplice funzione e n° 1 marittimo di coperta.
M/pesca da 3,01 TSL (entro le 20 MN)	<b>2</b> marittimi	n° 1 capo barca e n° 1 motorista abilitato <i>ovvero</i> n° 1 capo barca in possesso anche del titolo di macchina, previa autorizzazione all' imbarco in qualità di comandante autorizzato ad esercitare la duplice funzione e n° 1 marittimo di coperta.

Table 14 - Professional titles for deck and engineering duties with reference to the fishing activity (Source: Capitaneria di Rimini, ORD. n. 69/2019 - Modificata dall'Ord. n. 106/2019)

**Titoli professionali per i servizi di coperta:**

- a) "Marinaio autorizzato alla pesca": può assumere il comando di navi di stazza non superiore a 200 T.S.L. (cfr. art. 257 Reg. Cod. Nav.);
- b) "Capo barca per la pesca costiera": può assumere il comando di navi di stazza lorda non superiore a 100 G.T., adibite alla pesca costiera (cfr. art. Reg. 261 Cod. Nav.);
- c) "Conduttore per la pesca locale": può condurre navi di stazza non superiore alle 25 T.S.L. ed entro i limiti del mare territoriale, adibite alla pesca locale (cfr. art. 264 Reg. Cod. Nav.).

**Titoli professionali per i servizi di macchina** (l'abilitazione riguarda esclusivamente il tipo di motore per il quale è stata rilasciata):

- a) "Meccanico navale di seconda classe per motonavi": può assumere la direzione di macchina su motonavi adibite alla pesca, di stazza lorda non superiore alle 500 T.S.L. (cfr. art. Reg. 271 Cod. Nav.);
- b) "Motorista abilitato": può condurre motori a combustione interna o a scoppio installati su navi di stazza lorda non superiore a 100 G.T., adibite alla pesca costiera (cfr. art. 273 Reg. Cod. Nav.);
- c) "Marinaio motorista": può condurre motori a combustione interna o a scoppio installati su navi di stazza lorda non superiore alle 25 T.S.L., adibite alla pesca locale (cfr. art. 274 Reg. Cod. Nav.);

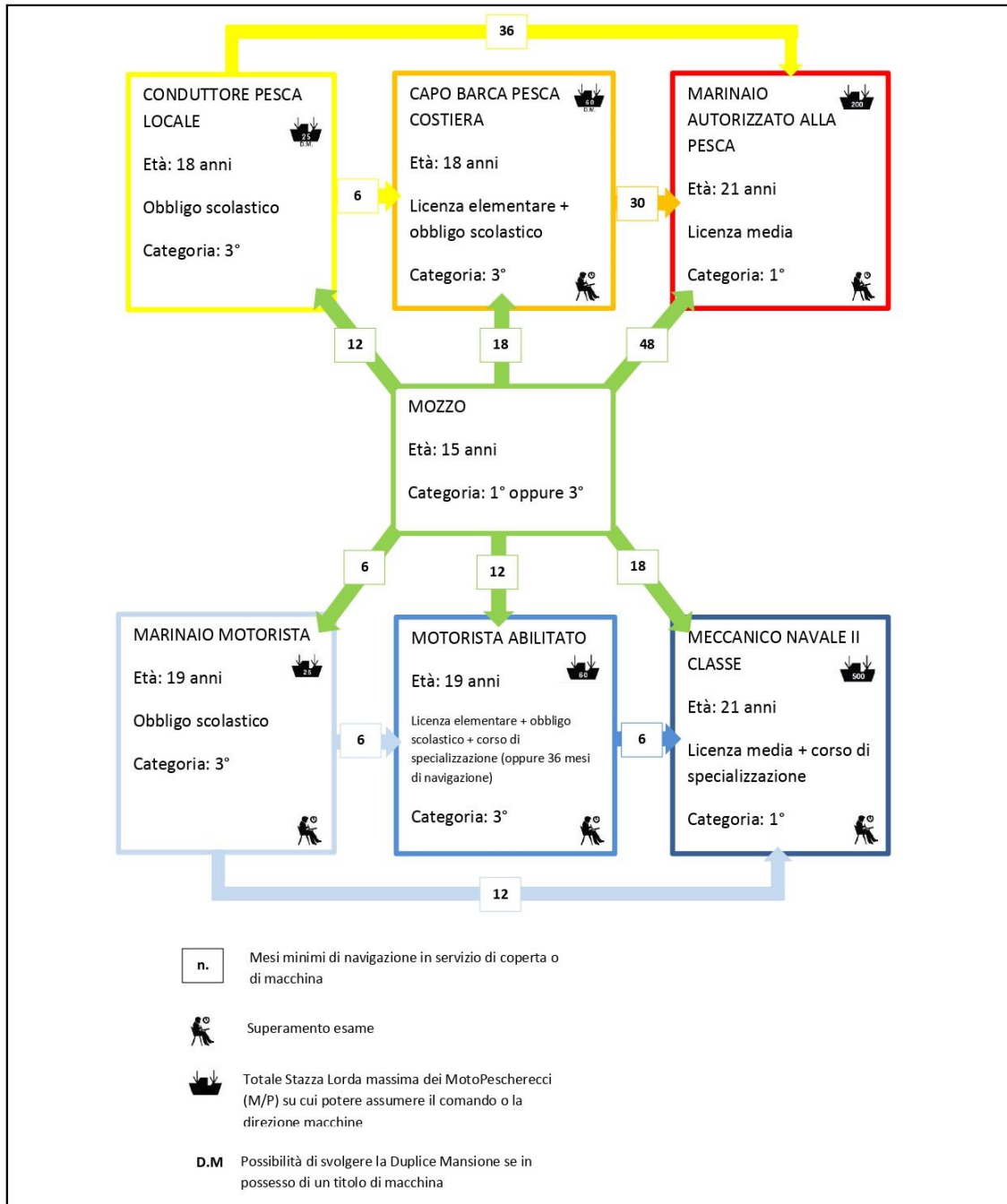


Figure 9 - Training pathways and requirements to take the exams in Port Authority Office and acquire professional maritime qualifications (M.A.R.E. Scarl elaboration)

As can be seen, the acquisition of experience through deck or engineering duties in navigation is compulsory in order to take the exams and this explains why younger fishermen either have not yet acquired any title, or have lesser titles.

As already described above, most of the interviewed fishermen have the “doppia mansione” (double job) (they have, therefore, a deck title and a engineering title), only four are simple sailors and only three have more than two professional titles (such as, for example, naval mechanic).

As regards the different fishing professions, it should be noted that half of the fishermen interviewed only carried out small-scale fishing. On average they have been working in the sector for 15 years, with a minimum of 2 years and a maximum of 35.

#### *Turnover and generated income*

In order to assess the turnover and income generated, economic data have been collected concerning 11 enterprises that have carried out in 2018 annual small-scale fishing activities, summarized in Table 15, of which structural data of the vessels are reported (Table 16). It should be noted that some enterprises also carry out other services, in addition to fishing, such as assistance to shellfish farms, sampling for research centres, etc.. There is a considerable difference between minimum and maximum values both in terms of total revenues and total costs.

However, the average of total revenues is about 50,000 euro/year, 95% of which comes from fishing. The total costs are about 37,000 euro/year, which corresponds to 74% of revenues. For many of these companies, the total costs also include those of employees, including contributions. In fact, these are often sole proprietorships in which the owner is also the shipbuilder and the only one embarked. By way of example, Figure 10 details the revenue items of one of these companies, which amount to 63,000 euro/year. It can be seen that 97% is attributable to the item "sale of finished products" which corresponds to sales to private retailers.

Only 3% of the revenues ("charges") come from sales to a wholesale fish market. Figure 11 details the items related to the main costs, which amount to about 40.000

euro/year. The two most relevant cost items are "Company vehicle management" which amounts to 35% and "Personnel costs" to 46%. The first item is 70% due to the cost of vessel engine fuel.

Table 15 - Economic data collected from artisanal small-scale fishing enterprises - 2018

Comp.	Port	Code	Activity	Total revenues (€)	Total revenues fishing activities (€)	Total costs (€)
Rimini	Cattolica	03RM001	A	60.493,14	60.493,14	24.989,16
Rimini	Cattolica	03RM002	A	70.110,38	44.360,38	60.925,71
Rimini	Cattolica	03RM003	A	44.328,01	44.328,01	25.855,05
Rimini	Cattolica	03RM004	A	63.427,00	63.427,85	39.778,74
Rimini	Rimini	00RM001	A	20.000,00	20.000,00	13.000,00
Rimini	Rimini	00RM002	A	25.800,00	20.400,00	21.650,00
Rimini	Bellaria	00RA001	A	53.492,50	53.492,50	44.933,70
Rimini	Bellaria	00RA002	A	54.971,15	54.971,15	46.175,77
Rimini	Bellaria	00RA003	A	38.017,70	38.017,70	31.934,87
Rimini	Bellaria	08RM001	A	56.495,30	56.495,30	47.456,05
Rimini	Bellaria	00RA004	A	57.383,70	57.383,70	48.202,31
			Min	20.000,00	20.000,00	13.000,00
			Max	70.110,38	63.427,85	60.925,71
			Media	49.501,72	46.669,98	36.809,21

Table 16 - Structural data of the vessels of the enterprises whose economic data have been collected.

n°	Code	Main Gear	LOA	Engine power (Kw)	Year of construction
1	03RM001	GNS	8,5	74.0	2009
2	03RM002	LLS	10,85	143,43	2007
3	03RM003	GNS	8,85	69.0	1992
4	03RM004	LLS	10,5	73,55	1997
5	00RM001	LLS	6,36	66,2	1991
6	00RM002	LLS	8,56	110.0	1989
7	00RA001	GND	6,3	150.0	1996
8	00RA002	LLS	8,9	150.0	1997
9	00RA003	GNS	5,95	0	1992
10	08RM001	LLS	8,28	94	1993
11	00RA004	GNS	5,94	0	1993

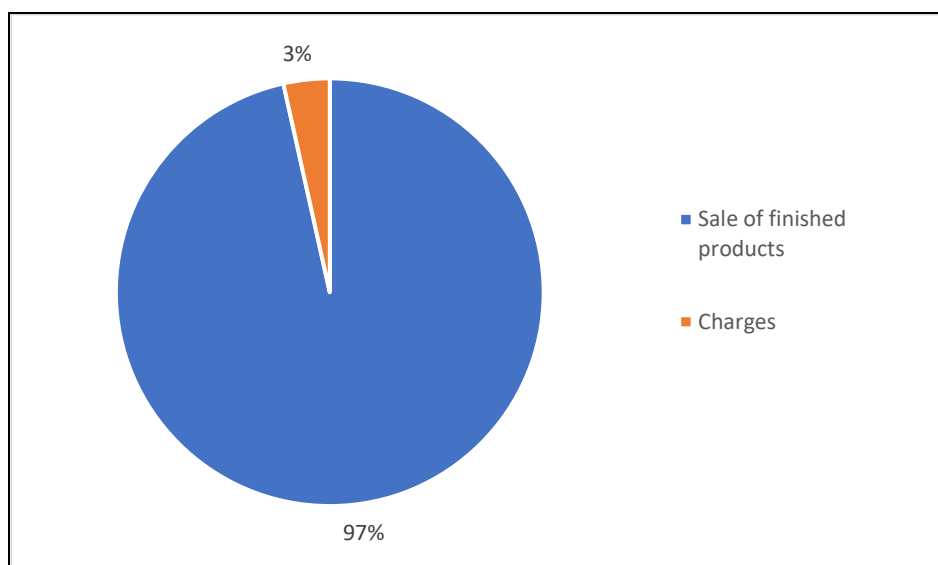


Figure 10 - Details of the main revenue items



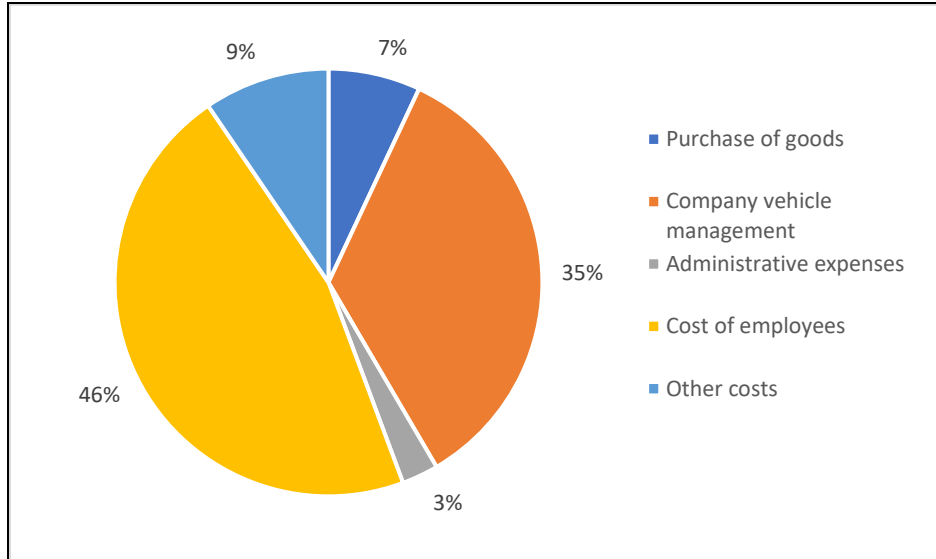


Figure 11 - Details of the main costs in the budget

## 4. Operational and economical characterization of artisanal small-scale fisheries

### *Seasonality and time trends*

Small-scale artisanal fisheries are characterised by a high seasonality, both in terms of the tools used and the target species. In extreme synthesis, it can be said that in the region the most widely used gears are generally the gillnets for the sole (*Solea vulgaris*), mantis shrimp (*Squilla mantis*) and other benthic or nectobenthic species, with a peak in the summer months during the biological rest period. From October to April many vessels fish with pots the marine snail (*Nassarius mutabilis*), while from April to June with the fyke nets the cuttlefish (*Sepia officinalis*) is mainly targeted. In the northern area, in the last few years, fishing with the pots for the mantis shrimp, carried out in all seasons, has also become widespread. While in winter, and practiced by few vessels, trammel nets fishing is present mainly targeting turbot. In the northern marinerries, the use of the trammel nets, but of different types, is used to catch cuttlefish in spring and fish in all seasons.

Summarizing, regarding the seasonality of the activity in study, we can say that the most practiced types of fishing in the 4 seasons are:

#### Winter:

- Pots for marine snails
- Gillnets
- Pots for mantis shrimp
- Trammel nets for turbot and other high value fish

#### Spring

- Pots for marine snails
- Gillnets
- Pots for mantis shrimp
- Fyke nets for cuttlefish

- Trammel nets for cuttlefish or prawn

#### Summer

- Gillnets
- Pots for mantis shrimp
- Trammel nets for high value fish

#### Autumn

- Pots for marine snails
- Gillnets
- Pots for mantis shrimp
- Trammel nets for turbot and other high value fish

#### *Gears in use*

The main gears of artisanal small-scale fishing, used in Emilia-Romagna, are described below, in order of importance.

**Gillnets.** When fishing with gillnets, also known as "barracuda" or smooth nets, variable mesh sizes can be used depending on the target species. Usually the net is composed by a nylon monofilament of 0,22-0,25 mm diameter and a variable mesh size (from 68-72 mm for sole/mantis shrimp, from 78/82 mm for meagre, brown meagre, European seabass and mullets), as well as the height and characteristics of footrope and headrope (usually headrope with 3,5 g of 5 mm of diameter and footrope 0,40/0,60 g), depending on the fishing areas and the target species. The nylon skein net costs about 18-20 euros per kg. Indicatively a 500 m long skein weighs about 4.5 kg (Figure 12).

Technically, according to FAO guidelines, it belongs to the general group of "Gillnets and Entangling Nets" and specifically to "Set Gillnets (Anchored)", code: GNS.

These nets, lowered and anchored on the bottom, operate in a nektobenthic environment, normally they are deployed in the afternoon and taken immediately after dawn the following day.

The vessels that practice this type of fishing can cover average distances ranging from 4 to 6 miles per day and sporadically reach even 20 to 25 miles per day depending on the type of target species, distribution, marine weather conditions.



Figure 12 - A nylon net skein



Figure 13 - Gill nets in the plastic boxes, ready to be deployed; the roller machine used for ordering the nets is also visible at center of the figure

The EU Reg. 1967/2006 provides that for "trammel nets and gillnets deployed on the bottom":

- 1) The maximum height of a trammel net may not exceed 4 m.
- 2) The maximum height of a gillnet deployed on the bottom may not exceed 10 m.
- 3) It is prohibited to have on board and set more than [...] 4.000 m of trammel nets and gillnets deployed per vessel, in the case of only one [...] and add another 1.000 m in the case of a second fisherman and another 1.000 m in the case of a third fisherman.

**Pots for marine snails (*Nassarius mutabilis*).** This tool is deployed on the bottom, therefore operating in a benthic environment and has an open truncated cone shape at the top, with a mesh size of about 14 mm. The structure is made of iron rod with a diameter of 8 mm, the diameter of the lower base is 440 mm, that of the upper base is 220 mm; it is 90 mm high. Currently the indicative price is 8 euro. It is completed with sardines or other dead fish as baits (Figure 14).

Technically, according to FAO guidelines, it belongs to the general group of "traps" and specifically in the "pots" group, with code: FPO .

Usually the deployment is composed of 25/30 traps and each vessel uses between 400 and 1000 units. They are deployed and left in the water for several days/weeks and are taken about 3 times a week from October to May. The fishing area ranges from 250 metres from the coast to 3 nautical miles.

For this gear there is a national regulation issued with D.M. of 30.11.1996, which regulates only the minimum size (20 mm) and refers to more specific local/compartamental regulations on fishing methods.



Figure 14 - Pots for marine snails

The marine snail fishing "is permitted with the exclusion of the use of gear known as "bottom" and "beam trawler". [... ]In order to protect the resource, the minimum catchable

size shall not be less than 20 millimetres. [...] For the determination of the minimum catchable size, the size of the species shall refer to the maximum height of the shell".

The regional compartmental regulations are very different between Rimini and Ravenna, as are those of the neighbouring compartments of Chioggia to the north and Pesaro to the south.

As example, some regulations valid in the Rimini compartment are summarised below:

The maximum quantities of product that can be fished daily by each unit qualified for this type of fishing are:

- 70 kg per vessel when only one fisherman
- 120 kg per vessel when two fishermen
- 150 kg per vessel when 3 or more fishermen

Fishing is forbidden on sundays and holidays: on these days it will be possible to go out to sea only for maintenance operations. A tolerance of 10% is allowed on the product fished with respect to the minimum measures (20 mm) imposed by the Ministerial Decree of 30.11.1996. Sieving: sieve must have no less than 12 mm square mesh and a distance between the rods of 9 mm. Sieving must be carried out on board. Technical stop of the activities from the 1st June to the 30th September. It is compulsory to submit a monthly statistical catch declaration.

In the Ravenna compartment, on the other hand, there is no maximum daily catch quota, nor is there a period of stop. This generates confusion and conflicts.

**Fyke nets for cuttlefish (*Sepia officinalis*).** The fyke nets (Figure 15) for cuttlefish is common in Emilia-Romagna. It is deployed at the bottom, then operates in a benthic environment and has a metal/plastic truncated cone structure arranged horizontally. The mesh cone remains open by means of 4 or 5 iron and/or plastic rings with a diameter of 6/8 mm. Inside there are two or three "cavities" that allow the entry but not the exit of the animal (cuttlefish but also fish or crustaceans as by-catches of commercial interest). The

mesh of the net is larger in the entrance part (60 mm), smaller in the centre (56 mm) and at the bottom from 34 to 40 mm. The current price is about 10/12 euros. Baits are not used but the gear exploits the reproductive needs of the cuttlefish. Sometimes the female, if captured, is left inside the fyke nets to attract the males. The deployments are usually composed by 15/20 units and each vessel uses between 400 and 700 units. They are deployed in an area ranging from 0.5 miles to 2-3 miles off the coast and are left in the water for several days/weeks. They are also sailed every day from March to June. In the last few years the season has lengthened and it lasts until the first days of August. .



Figure 15 - Fyke nets in maintenance after the fishing season



Also for this fishing activity, as for the one with the snail pots, there are compartmental ordinances. The regulations in both Rimini and Ravenna compartments provide for the possibility of lowering a maximum of 400 gear per vessel. The number of tools increases by 300 with two or more fishermen on board. Each vessel can use a stretch of water with a front not exceeding 300 linear metres. Within this stretch of water the fyke nets must be lowered in rows parallel to the coastline, these rows must be no less than 150 m apart from each other. The vessels or fishing cooperatives must communicate annually the stretch of sea in which the individual fisherman wants to practice professional fishing, indicating corresponding reference points on land. The communication must include: name and surname of the fisherman; initials and name of the unit to be used; number and year of issue of the fishing licence/temporary certificate; power of the motor apparatus; readable signature of the person concerned.

The gears at sea must be specially marked with visible signs; during the day with a yellow float with a 150 cm pole and yellow flag, at night with a yellow light visible from a distance of at least half a mile.

Before carrying out the cleaning operations of the tools, it is compulsory to remove by hand any eggs that may have been laid on the tool, avoiding their destruction with the utmost care and throwing them back into the sea. Cleaning operations may only be carried out at sea and the use of any chemical substance is forbidden. Cleaning operations are however forbidden from 15th of July to the 31st of August of every year.

**Mantis shrimp pots (*Squilla mantis*).** Fishing for mantis shrimp with pots is the most recent activity of artisanal fishing in Emilia-Romagna. It must be said immediately that this gear appeared in the northern Adriatic about fifteen years ago, but only in the last few years has it spread to the ports from Goro to Cesenatico, with good results. It operates in a benthic environment, between 5 and 7 nautical miles from the coast, when this is possible in relation to the overlapping areas for bottom trawlers fisheries .

Technically, according to FAO guidelines, it belongs to the general group of "traps", and specifically of the group of "pots", with code: FPO .

Several models have been developed, both to improve their trapping efficiency and to lower the price of the gear. The pot here described and photographed is the one in use this year in Cervia.

They are pots with an approximate shape of a parallelepiped with a basis of 30 x 30 cm and 14 cm high. It has a self-supporting structure of electrowelded and plasticized wire mesh and rectangular mesh 1 x 2 cm. As can be seen in Figure 16 there is a funnel-shaped opening, a small door for retrieving the catches, a small cylinder of net to leave the bait, which is usually a sardine or a similar fish.

They are tied to a 6-8 m rope. The deployment is about 500 metres long, for a total of 70/80 pots. The pots are left in the water for several weeks and checked/baited at least once a day.

The yield is obviously very variable. As a guideline, 3 or 4 mantis shrimp can be fished in one pot per day. The pots can be used all year round, with daily yields varying between 10/30 kg.

At the moment there is no national or compartmental regulation specifically concerning this fishery. EU Reg. 1967/2006 provides that for "deep sea crustacean traps" it is forbidden to keep on board or set more than 250 traps per vessel. There is no rule regulating the minimum size, fishing season or other.



Figure 16 - Mantis shrimp pots, in use in Cervia (RA)

**Trammel net.** There are various types of trammel nets on the basis of which target species (e.g. turbot, cuttlefish, prawns, large fish) the fishermen is aiming for.

Trammel nets are characterised by an intermediate "cloth" with a variable mesh size (approximately 20-80 mm) and two external cloths with a mesh size of 150-400 mm depending on the type. Variable are also the height and characteristics of the headrope and footrope of this net.

Technically, according to FAO guidelines, it belongs to the general group of "Gillnets and Entangling Nets" and specifically to "Trammel Nets", code: GTR.

In Emilia-Romagna, each vessel usually drops about 2 km of net. It operates in a benthic environment. For some years now, especially in Cervia and Cesenatico, the most

common target species is turbot, but other types of trammel nets have cuttlefish (northern area of the Ravenna compartment) and prawns as target species. Trammels dedicated to the fishing of leerfish, meagres, brown meagres and seabasses are also used. It is normally deployed in the late afternoon and taken immediately after dawn the following day. The turbot are fished in the winter months, the cuttlefish in the spring, the prawns in the summer. The fishing period is from October/November to January/February. The trammel for cuttlefish and the one for shrimps are lowered from March/April to June/July.

Also in this case, consumption and turnover depend on the type of use of the gear.

When fishing for turbot, a few miles a day are covered because the gear is deployed very close to the coast, from 0.5 miles to a maximum of 2 miles.

When fishing for large fish such as meagre and European seabass, the distance travelled can be greater to reach fishing areas with underwater structures even outside the compartment.

Describing the types of trammel nets, the one for fishing for cuttlefish is characterised by an internal cloth with 36 mm mesh and two external walls with 150 mm mesh. It is mainly used under the coast.

The trammel net for fishing for prawn is characterised by an internal cloth with 22 mm mesh and two external cloths with 150 mm mesh. Not commonly used, it is deployed a few miles from the coast from March/April to May/June.

For the trammel net, the same rules summarised above apply as for the gillnet.

### *Local specificity of the various ports*

The following is a brief summary of the specificities of the different ports, from north to south. In the compartment of Ravenna, the area of Goro is characterized by the manila clam farms, which also employs several vessels that have a fishing licence, attributable to the artisanal small scale fishing, as specified above. The other fishermen operate both in lagoon and in the open sea. In this area cuttlefish fishing is mainly carried out with fyke nets or trammels. Also gillnets, both set gillnets and trammel nets, are widely used to catch sea bass, sea bream, meagre and other large fish, as well as sole, shrimps and tub gurnards. Also with reference to gillnets, very important in the Ravenna compartment is the fishing of mullets. In the Goro area there are also 3-4 enterprises dedicated exclusively to fishing in lagoon areas with highly specific gears targeting species not common in other areas: “schille” (*Palaemon spp*), eels (*Anguilla anguilla*), “moleca” (*Carcinus aestuarii*) and “latterino” (*Atherina spp*). For some years now, among the target species, the swimming or blue crab (*Callinectes sapidus*), an allochthonous species referred to in WP 3.3, has been added.

Going down along the coast, from Porto Garibaldi and Ravenna, the artisan small-scale fishing is practiced exclusively at sea, basically with the same gears used in Goro and in the southern ports, with the difference that as a target species the snail is certainly not as important, at least in the northern area of Ravenna's breakwaters. It should be noted that in the Ravenna area, fishing with gillnets is practiced almost all year round, while in the Rimini area, on the contrary, many vessels practice it only during the summer period, when fishing for snails is forbidden.

In the last few years, starting from Ravenna and as far as Cervia and Cesenatico, the pot for shrimp fishing is also used, a gear which is practically absent in the southern area at the moment. Recently used and in continuous improvement, the pot for shrimps can be used all year round and there are no “ad hoc” regulations up to now, not even at a compartmental level. In Cervia some fishermen practice this type of fishing only until the end of October and in the following months they dedicate themselves to turbot fishing with trammel nets.

Starting from the Cesenatico area and going down until reaching Cattolica, almost exclusively set gillnets targeting soles and mantis shrimp are used. Rare is the use of trammel nets with some sporadic cases in the area of Rimini and Cattolica both for catching large fish and, even more rarely, for catching cuttlefish and prawns. But in the Rimini compartment the prevailing activity, at least from October to May, is snail fishing, which, as we have already said, is the subject of compartmental regulations issued by order of the Port Authority office.

From mid-March to June, almost all vessels fish for cuttlefish with fyke nets. Also in this case fishing has been regulated by an order of the Port Authority office.

#### *Gear selectivity, discards and environmental impact*

The gears used by small-scale artisanal fishing are generally selective, much more in comparison to the trawling nets, which always operate on the bottom, in benthic or nektobenthic environments.

Having said this, we come briefly to describe the selectivity, waste and environmental impact of the individual gears, listed generically by importance.

1. Set gillnets; they are multi-specific nets as described above. The selectivity depends on the mesh size, height, and rigging (headrope and footrope), which make them operate at different heights from the bottom and in a more or less vertical position. Very roughly speaking, it is possible to estimate a quantitative discard in the order of 10-30 % of the overall catch (including a very small part of undersize animals, while the others are ruined organisms and non-commercial species, mainly crabs), which varies according to the season, the fishing area and the state of the sea. Therefore, a minimum discard if compared to bottom trawling. A part of the discard is thrown back into the sea in the fishing area, thus feeding the scavenger species.
2. Marine snail pots: it is a tool that has only one target species but is very efficient also for a similar species belonging to the genus *Nassarius*, commercially called "false snail" or vulgarly "black snail" or "punta". These can also account for 50-70%

of the catch, but it should be noted that they are commonly thrown back into the sea alive, so they cannot be technically assimilated to discards. The undersized snail is also thrown back into the sea alive. On board, the first selection is carried out by a rotating drum machine, the second by hand.

3. Fyke nets for cuttlefish; It is a species-specific instrument and in this case by-catches are extremely limited, less than 5% by weight. Juvenile individuals are not caught either.
4. Pots for mantis shrimp; is a species-specific instrument and in this case by-catches are extremely limited, less than 5% by weight. In contrast to the fyke nets, juvenile mantis shrimps are caught, but those are normally thrown back into the sea alive.
5. Trammel nets: these are also multi-species nets as described above which, in relation to their mode of operation, have an even broader spectrum of capture, both by species and by size. The selectivity depends on the mesh size of the three pieces that compose them, on the height and the rigging (headrope and footrope), which make them operate at different heights from the bottom and in a more or less vertical position. Very roughly speaking, it is possible to estimate a quantitative discard in the order of 20-40 % of the overall catch (non-commercial species, mainly crabs), which varies according to the season, the fishing area and the state of the sea. Even for these nets, however, the discard is lower than for trawl fishing. A part of the waste is thrown back into the sea in the fishing area, thus feeding the scavenger species.

## 5. Qualitative and quantitative description of landings, seasonality and time trends, local variations, market value of the products caught

### *Qualitative and quantitative description of landings, seasonality and time trends, local variations*

It should be noted that only a small part of the product landed from small-scale artisanal fishing ends up on wholesale fish markets. In fact, most of it is sold directly to retailers or consumers at the docks. For the latter, the references are Reg. CE n. 3703/85 which lays down the implementing rules of the common marketing standards for some fresh or chilled fish, the hygienic-sanitary regulations Reg. CE 853/2004 and 852/2004, which provide the possibility for fishermen to sell directly to consumers the catch within the limit of a small quantity, equal to 100 kg per daily landing of the vessel. Moreover, as provided for by the Ministerial Decree of 10 November 2011 and in accordance with art. 58, paragraph 8, small quantities of products sold directly from the fishing vessel to the consumer, which do not exceed a value equal to 50 euros per day per final consumer, are exempted from the traceability obligations provided for by art. 58 of EC Reg. 1224/2009. Similarly, according to the art. 35, paragraph 4, of Reg. (EU) 1379/2013 which refers to art.58, paragraph 8, of Reg. (EC) 1224/2009, small quantities of products sold on the docks, directly from the fishing vessel to the consumer that do not exceed a value equal to 50 euros per day per final consumer, are exempted from the traceability obligations provided for by the same art. 35.

In relation to this, the collection of landing/marketing data remains one of the most serious problems of this type of fishing. However, in order to try to describe landings qualitatively and quantitatively, some data are summarised below, partly from the bibliography, partly collected directly by fishermen or on wholesale markets.



In order to outline an introductory picture concerning fishing in Emilia-Romagna, 17,460 tons of fishing products were landed in 2017, for a value of 43 million Euros. It should be remembered that in recent years catches in Emilia-Romagna represent about 9% of the national total, while revenues reach 5% of the national total. Two figures that reflect the importance of massive species of relatively low commercial value. The quantities landed, as already highlighted, have collapsed in recent years. A drastic decrease, only minimally offset by the slight increase in prices (Figure 17). In relation to this, the collection of landing/marketing data remains one of the most serious problems of this type of fishing. However, in order to try to describe landings qualitatively and quantitatively, some data are summarised below, partly from the bibliography, partly collected directly by fishermen or on wholesale markets.

In order to outline an introductory picture concerning fishing in Emilia-Romagna, 17,460 tons of fishing products were landed in 2017, for a value of 43 million Euros. It should be remembered that in recent years catches in Emilia-Romagna represent about 9% of the national total, while revenues reach 5% of the national total. Two figures that reflect the importance of massive species of relatively low commercial value. The quantities landed, as already highlighted, have collapsed in recent years. A drastic decrease, only minimally counterbalanced by the slight increase in prices (Figure 17).

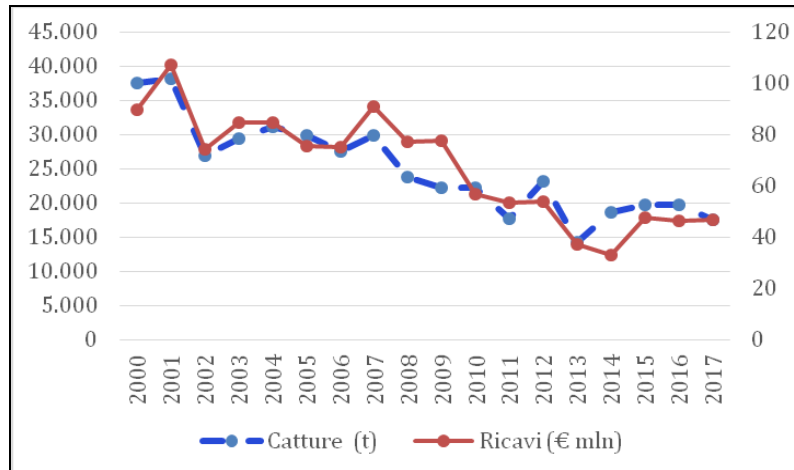


Figure 17 - Trends in catches (in blue) and revenues (in red) from fishing in Emilia-Romagna (Source FLAG CER)

Having said that, the data of two wholesale fish markets are presented: Cattolica and Goro, kindly granted by the latter for processing, concerning some of the main target species of small-scale artisanal fishing. A further clarification concerns the fact that the landed is given to wholesale markets also from seller coming from other compartments, therefore they do not give precise indications on the landing of the seafood.

Let's start by analysing the sales data of the mantis shrimp. Interesting are the sales data for the month of August, which coincides with the stop fishing of the trawl, which can therefore be traced back to small-scale artisanal fishing. In that month, small-scale fishing guarantees the continuity of supplies, which are also important in relation to catering activities and more generally to tourism.

Table 17 - Trend of mantis shrimps (*Squilla mantis*) sold in Cattolica and Goro wholesale markets, 2018-2019.

Months	Cattolica		Goro	
	Average quantity 2018-2019 (kg)	Mean price 2018-2019 (euro/kg)	Average quantity 2018-2019 (kg)	Mean price 2018-2019 (euro/kg)
January	1.468,6	9,6	7.781,8	7,0
February	1.039,4	11,0	2.531,5	9,2
March	890,5	14,9	1.130,7	14,0
April	738,7	15,6	5.687,1	10,0
May	958,9	14,0	8.446,4	9,2
June	1.192,9	9,6	6.771,0	10,3
July	1.457,4	9,4	11.469,2	7,2
August	2.013,6	10,3	8.345,7	9,0
September	2.604,6	6,2	11.045,6	5,6
October	2.958,1	7,4	12.457,4	6,0
November	4.745,7	5,6	14.732,1	5,0
December	3.611,9	7,2	13.148,2	7,9
Totale	23.680,7	8,5	103.546,8	7,4

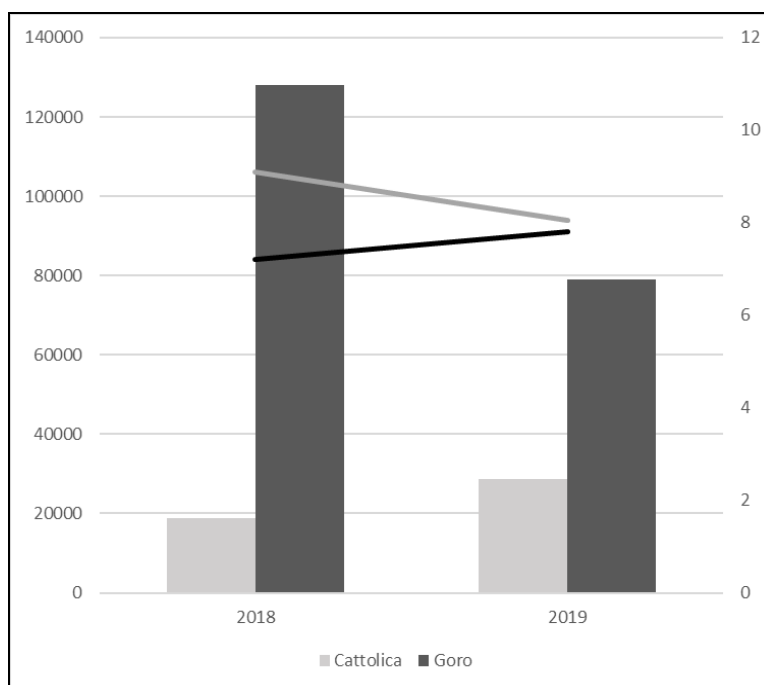


Figure 18 - Landed in kg and average annual price of the target mantis shrimp (*Squilla mantis*) at the wholesale markets of Cattolica and Goro

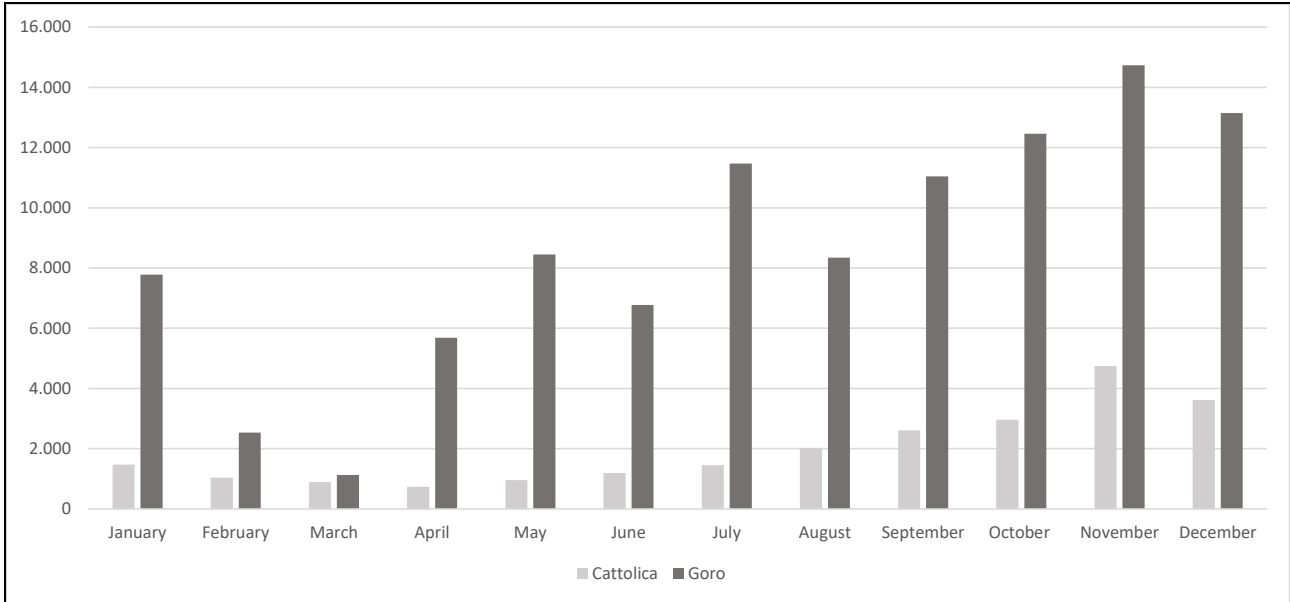


Figure 19 - Mantis shrimp in Cattolica and Goro, mean landed product per month (2018-2019)

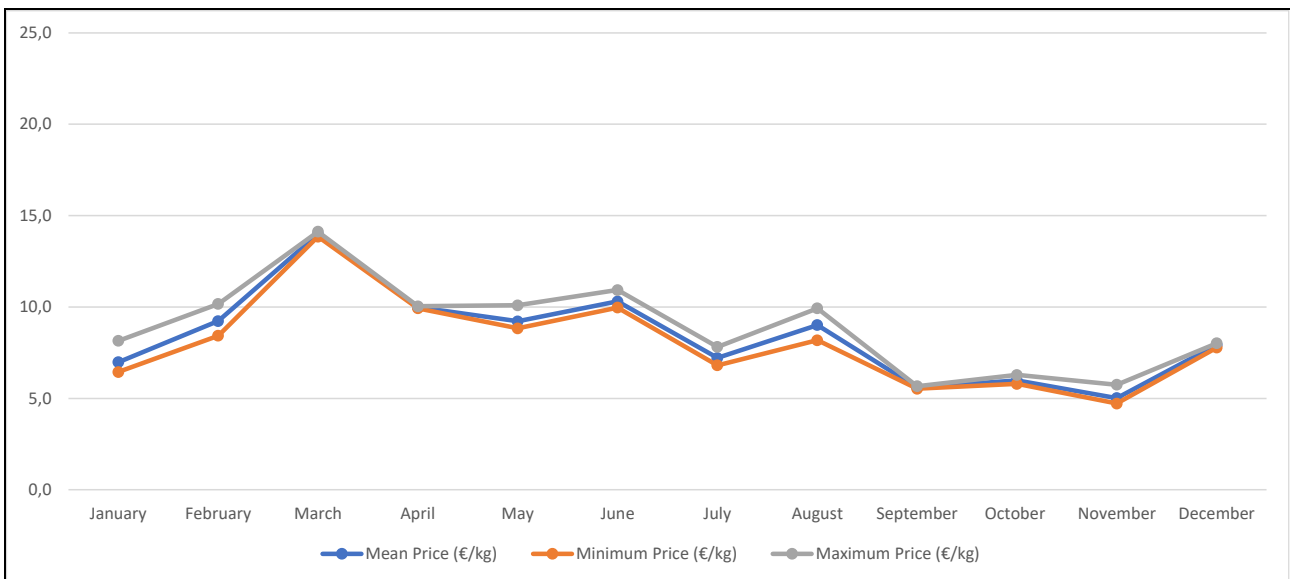


Figure 20 - Mantis shrimp in Goro, monthly aggregated mean, minimum and maximum price (2018-2019)

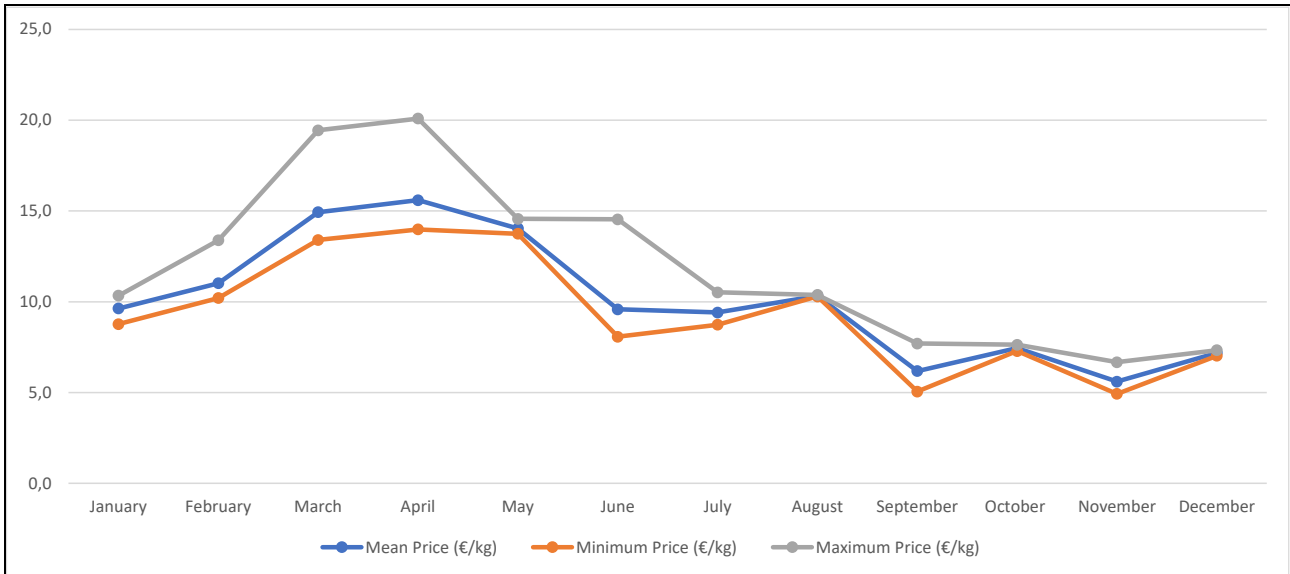


Figure 21 - Mantis shrimp in Cattolica, monthly aggregated mean, minimum and maximum price (2018-2019)

The following tables and graphs describe the marketing of sole (*Solea vulgaris*). Also for this species the attention must focus on the month of August, when it is fished only by the small artisanal fishing. The same considerations apply as for shrimps. The decrease in average price over the two years is probably due to the greater quantity landed, sold directly to traders. It is also highlighted that on average in Goro the price is lower than in Cattolica, with the exception of the month of August.

Table 18 - Trend of sole (*Solea vulgaris*) sold in Cattolica and Goro wholesale markets, 2018-2019

Months	Cattolica		Goro	
	Average quantity 2018-2019 (kg)	Mean price 2018-2019 (euro/kg)	Average quantity 2018-2019 (kg)	Mean price 2018-2019 (euro/kg)
January	1.318,0	11,7	144,9	9,0
February	1.387,9	11,2	422,8	5,8
March	1.885,9	11,6	373,0	6,7
April	2.406,9	11,0	1.031,5	5,6
May	2.733,9	9,8	163,1	8,2
June	2.520,8	10,9	161,1	7,9
July	3.063,2	11,3	242,2	8,8
August	2.150,8	14,7	266,2	12,9
September	2.868,7	10,5	571,2	8,7
October	3.533,6	10,0	704,7	8,0
November	3.662,3	8,3	356,1	8,9
December	1.896,5	10,8	254,2	7,7
Total	29.428,9	10,8	4.691,4	7,7

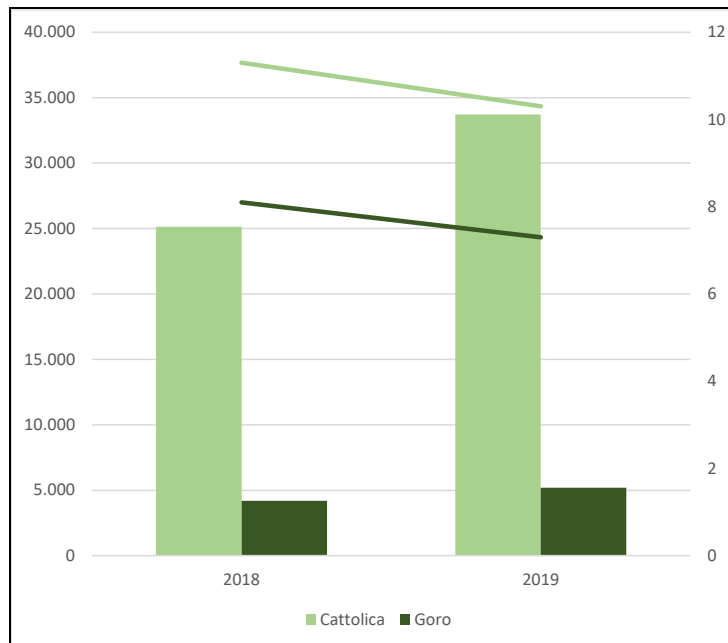


Figure 22 - Landed in kg and average annual price of the target sole (*Solea vulgaris*) at the wholesale markets of Cattolica and Goro

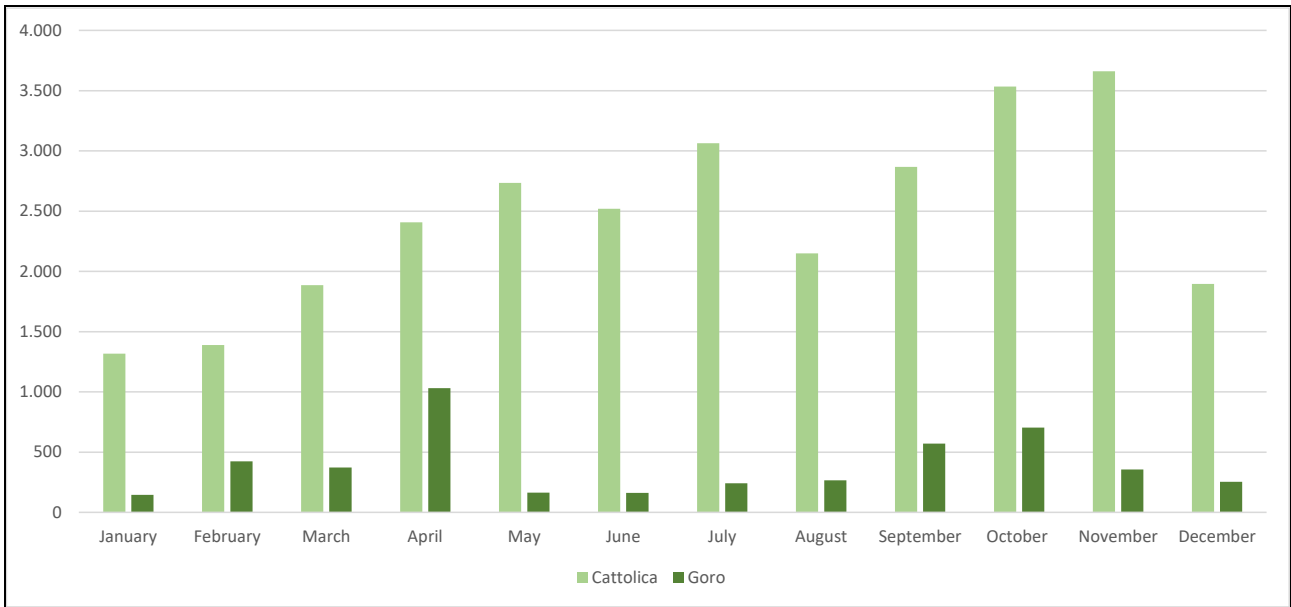


Figure 23 – Sole in Cattolica and Goro, mean landed product per month (2018-2019)

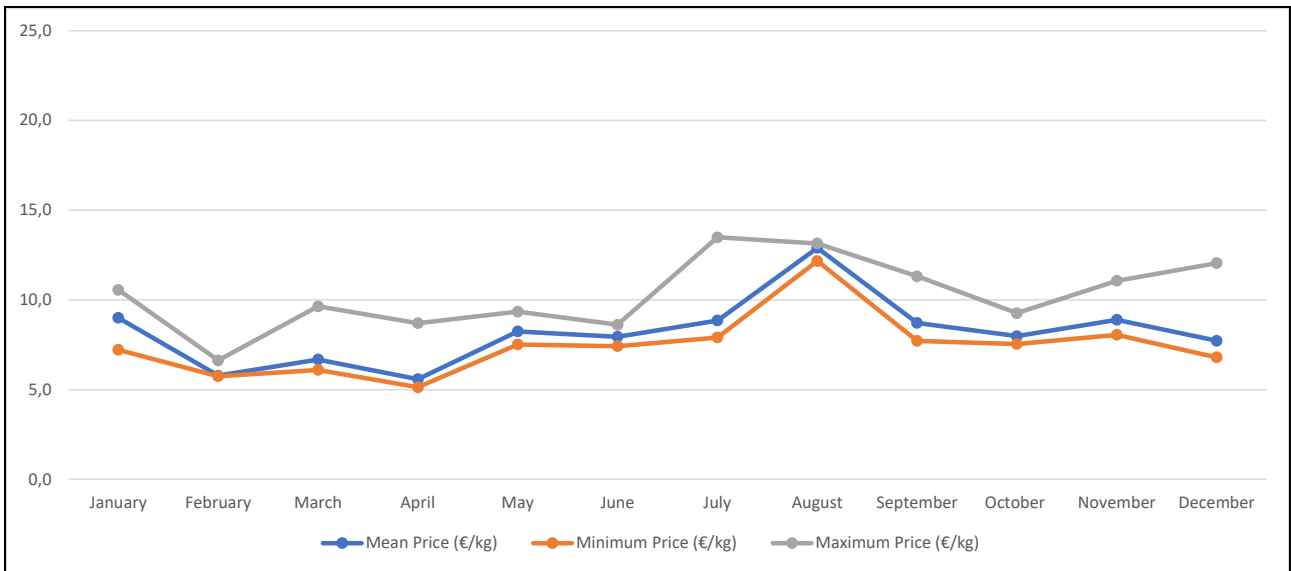


Figure 24 - Sole in Goro, monthly aggregated mean, minimum and maximum price (2018-2019)

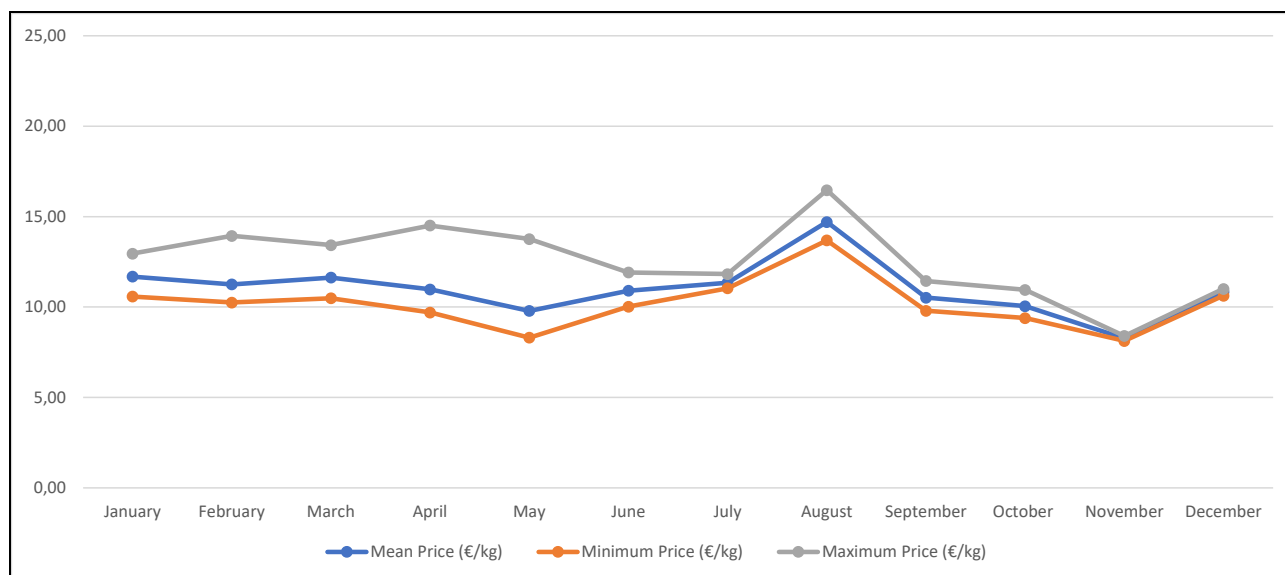


Figure 25 - Sole in Cattolica (RN), monthly aggregated mean, minimum and maximum price (2018-2019)

We now move on to cuttlefish, the main cephalopod caught in Emilia-Romagna. If, in general, in the last decade there has been a strong decrease in landings, in the two-year period 2018-2019 in Cattolica and Goro the values remained constant, respectively around 10/12 ton/year on both wholesale markets. The average price has also remained constant and comparable, around 8,50 €/kg. The months with the highest quantities are April and May, a period of concentration of reproduction below the coast and a period of catch for small-scale artisanal fishing.



Table 19 - Trend of cuttlefish (*Sepia officinalis*) sold in Cattolica and Goro wholesale markets, 2018-2019

Months	Cattolica		Goro	
	Average quantity 2018-2019 (kg)	Mean price 2018-2019 (euro/kg)	Average quantity 2018-2019 (kg)	Mean price 2018-2019 (euro/kg)
January	759,4	9,9	56,8	8,2
February	578,8	10,3	111,4	7,1
March	808,6	11,7	198,3	9,5
April	2.134,6	5,1	2.743,6	7,1
May	2.003,1	5,5	4.949,1	8,5
June	800,1	9,1	2.722,7	10,4
July	343,7	12,7	419,7	11,9
August	96,7	18,7	0	//
September	1.240,5	11,4	734,9	8,3
October	1.183,3	12,1	1.867,2	7,8
November	597,1	11,4	120,1	6,4
December	811,7	10,1	35,1	8,4
Total	11.357,7	8,9	13.959,1	8,6

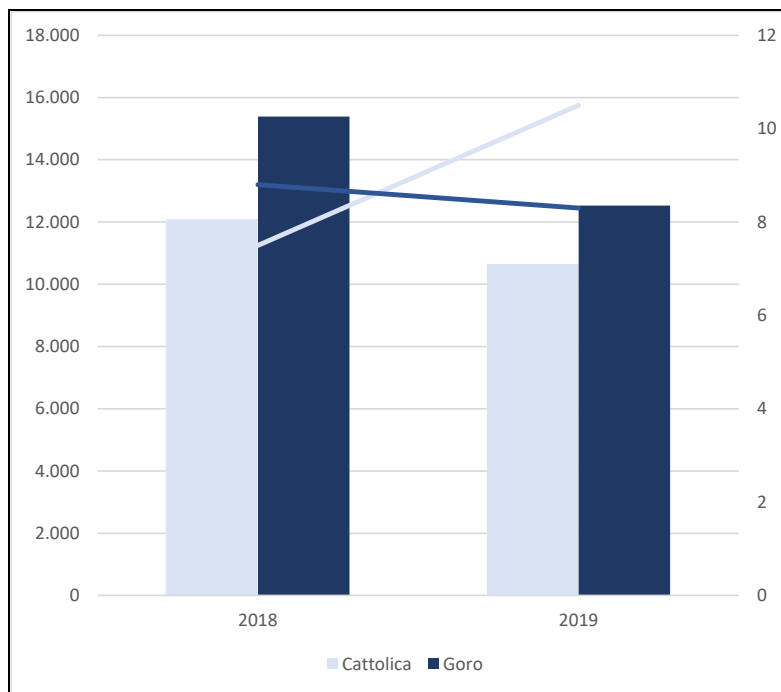


Figure 26 - Landed in kg and average annual price of the target cuttlefish (*Sepia officinalis*) at the wholesale markets of Cattolica and Goro

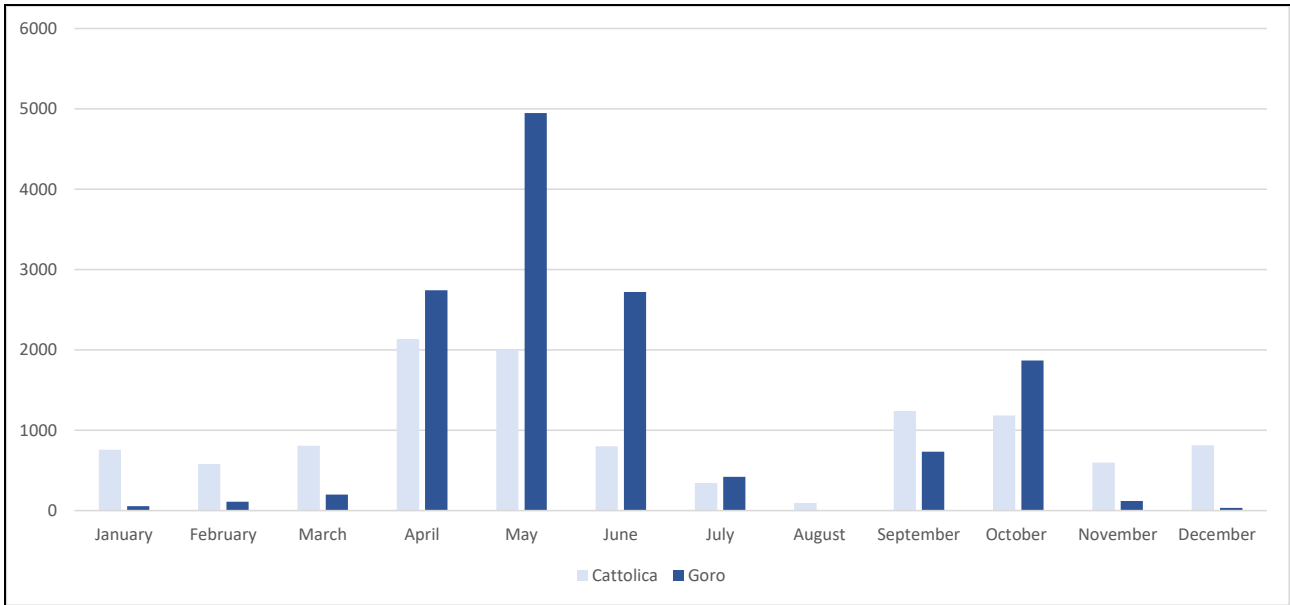


Figure 27 - Cuttlefish in Cattolica and Goro, mean landed product per month (2018-2019)

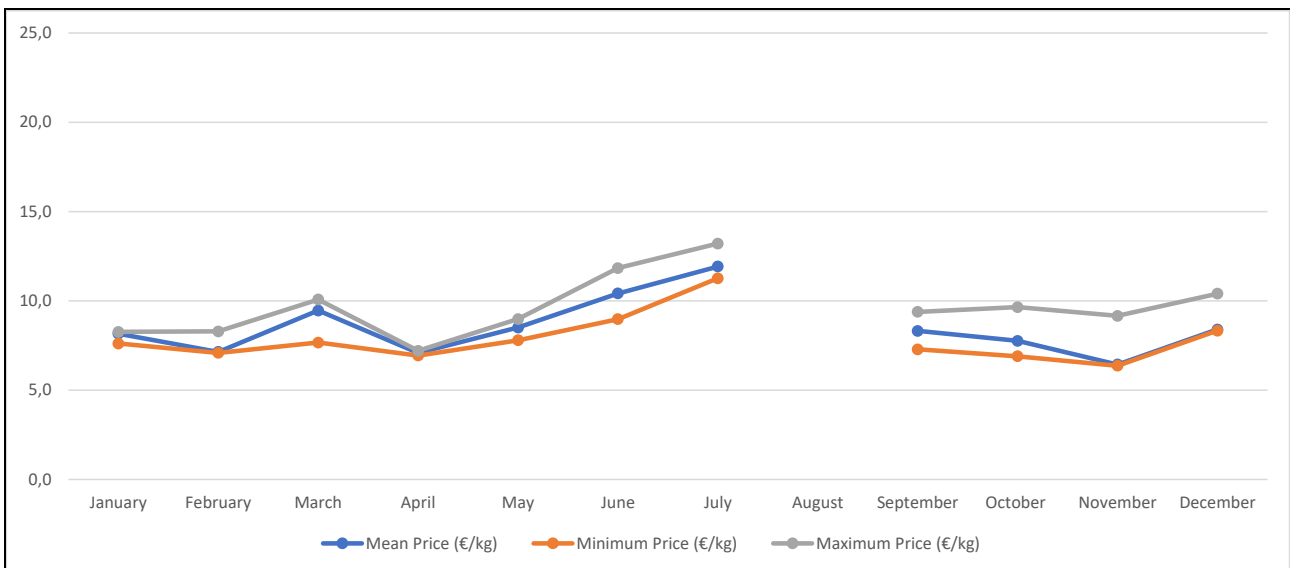


Figure 28 - Cuttlefish in Goro, monthly aggregated mean, minimum and maximum price (2018-2019)

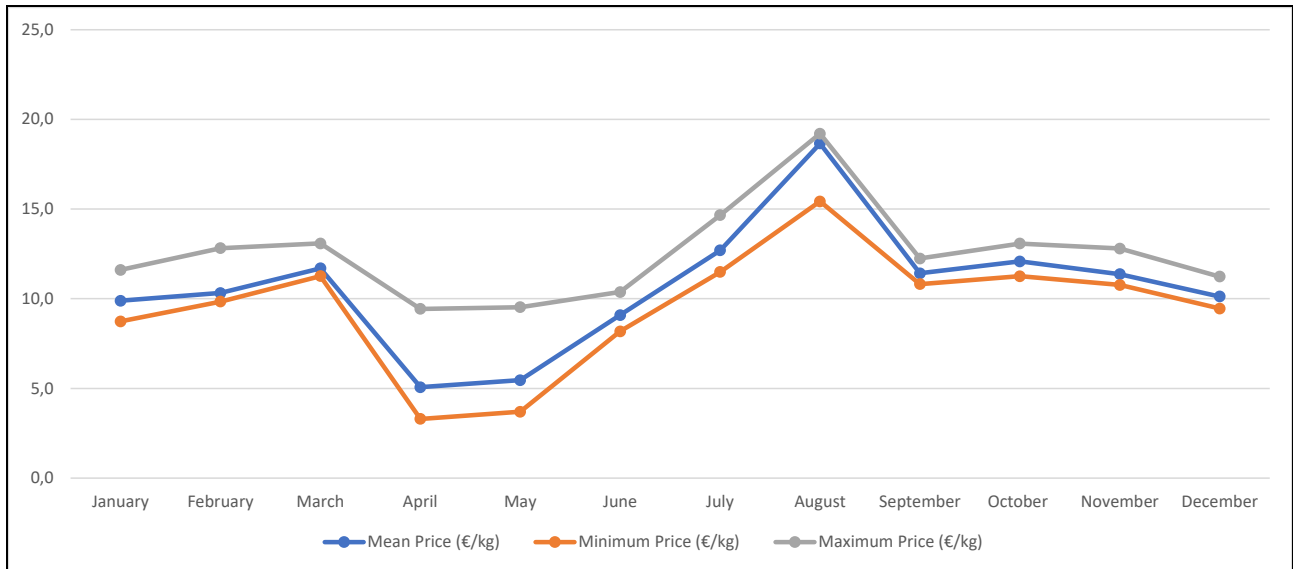


Figure 29 - Cuttlefish in Cattolica, monthly aggregated mean, minimum and maximum price (2018-2019)

Finally, as far as the marine snail is concerned, only Cattolica's fish market data are available. In Goro it is not a significant fishery and in any case it has never been sold on the market. If as far as the quantities are concerned, the data are at least one order of magnitude lower than the landed one, indicative is the price trend, which has oscillated between 2,70 and 4,50 €/kg.

Table 20 - Trend of marine snail (*Nassarius mutabilis*) sold in Cattolica market, 2018-2019

Months	Cattolica	
	Average quantity 2018-2019 (kg)	Mean price 2018-2019 (euro/kg)
January	226,2	4,0
February	198,0	4,0
March	311,6	4,5
April	1.010,7	2,8
May	291,0	4,1
June	0,0	//
July	0,0	//
August	0,0	//
September	0,0	//
October	723,9	2,5
November	481,0	2,9
December	88,7	3,5
Total	3.331,0	3,2

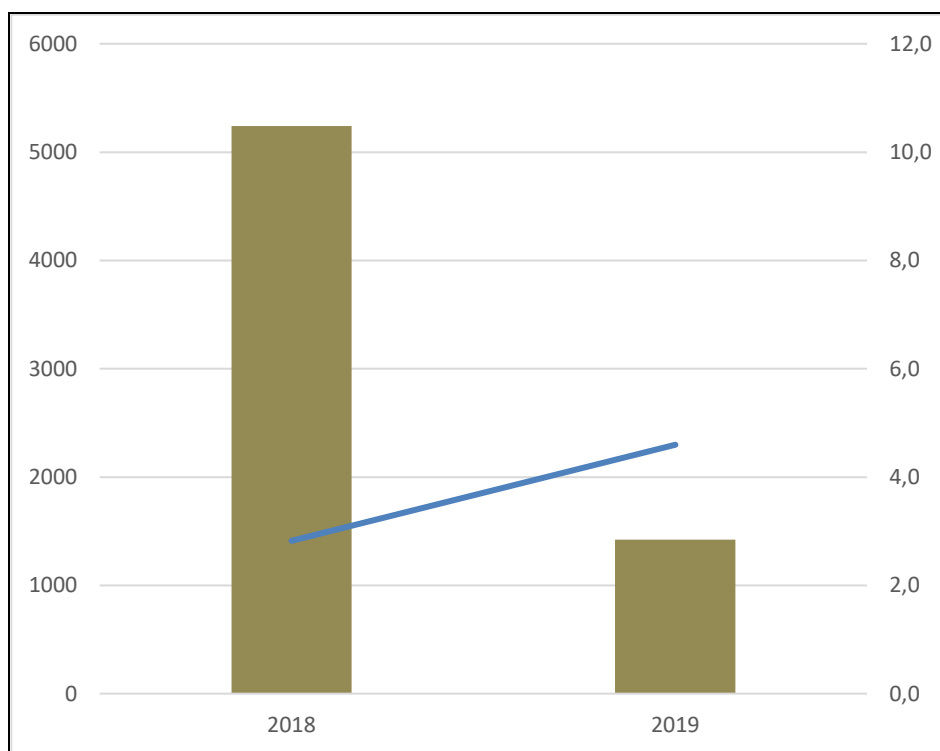


Figure 30 - Landed in kg and average annual price of the target marine snail (*Nassarius mutabilis*) at the wholesale markets of Cattolica and Goro

In outlining a more specific framework for fishing systems (Table 21) it is evident that small-scale artisanal fishing lands 11% of the regional product, for a much higher value, equal to 25% of revenues, in relation to the higher prices of the species fished in comparison with other systems.

Table 21 - Economic and technical characteristics per fishing system (2017) (source FLAG CER)

Systems	Landings (t)	%	Revenues (mln €)	%	Prices (€/kg)
Bottom trawler	4.267	24%	23,15	49,4%	5,43
Pelagic trawler	8.949	51%	5,76	12,3%	0,64
Dredges	2.195	13%	5,05	10,8%	2,30
Artisanal small-scale fishery (static gears < 12 m loa)	1.896	11%	11,93	25,5%	6,29
Small scale fishery (multi-purpose gears – active and static gears > 12 m loa)	153	1%	0,94	2,0%	6,16
Total	17.460	100%	46,82	100,0%	2,68

On a sample basis, the landings data of the 11 companies examined for economic aspects were then collected. The data on annual fishing days, landed, target species and gear are summarized in Table 22. The average number of fishing days is 120, with a high variability from a minimum of 53 to a maximum of 182. It should be noted that the average figure (120 fishing days) is underestimated in relation to the presence of vessels not fishing in some months of the year. The quantities landed are also very variable, ranging from about 3,500 kg/year to 30,000 kg/year, with an average of 13,170 kg/year, equal to a daily value of 110 kg/day. As can be seen, the number of target species are from 2 to 4, in quantitative order of importance: snail, cuttlefish, sole and mantis shrimp.

Table 23 shows an analysis of the annual landings by species, where the prevalence of snail and cuttlefish is shown. Snail is fished on average 75 days/year, while cuttlefish has a shorter season quantifiable in 29 days/year. The vessels surveyed fish on average in a limited number of days (10 days/year) with nets, normally in the weeks when trawling stops. With the same data, Figure 31 shows the annual trend of monthly fishing days,

divided by the three ports considered. The trend is substantially the same, typical of vessels mainly engaged in snail and cuttlefish fishing. Finally, Figure 32 compares the monthly fishing days for the three different types of gear, which confirm the trends described above.

Table 22 – Artisanal SSF vessels in analysis, fishing days, product landed, species targeted and gears; 2018

N°	Code	Annual days of fishing activity	Total product landed (kg)	Annual number of target species	Annual number of gears in use
1	00RA001	66	13.314,0	2	2
2	00RA002	130	10.704,5	3	3
3	00RA003	53	10.646,0	2	2
4	08RM001	129	12.314,5	2	2
5	00RA004	83	11.215,0	4	3
6	03RM001	182	30.264,0	3	3
7	03RM002	77	18.224,5	3	3
8	03RM003	152	13.447,0	3	2
9	03RM004	173	17.757,6	3	3
10	00RM001	85	3.483,0	2	2
11	00RM002	85	3.506,0	3	3
Total		1.215	144.876,1	//	//
Average		120	13.170,6	2,7	2,5

Table 23 – Average annually landed product and fishing days per species and per vessel; 2018

Species	Vessels (n°)	Average annually landed quantity per vessel (Kg/year)	Average annually days of fishing activity per vessel (d/year)
Marine snail	11	10.946,7	75,7
Cuttlefish	11	1.758,5	29,2
Mixed products	6	1.698,2	10,2

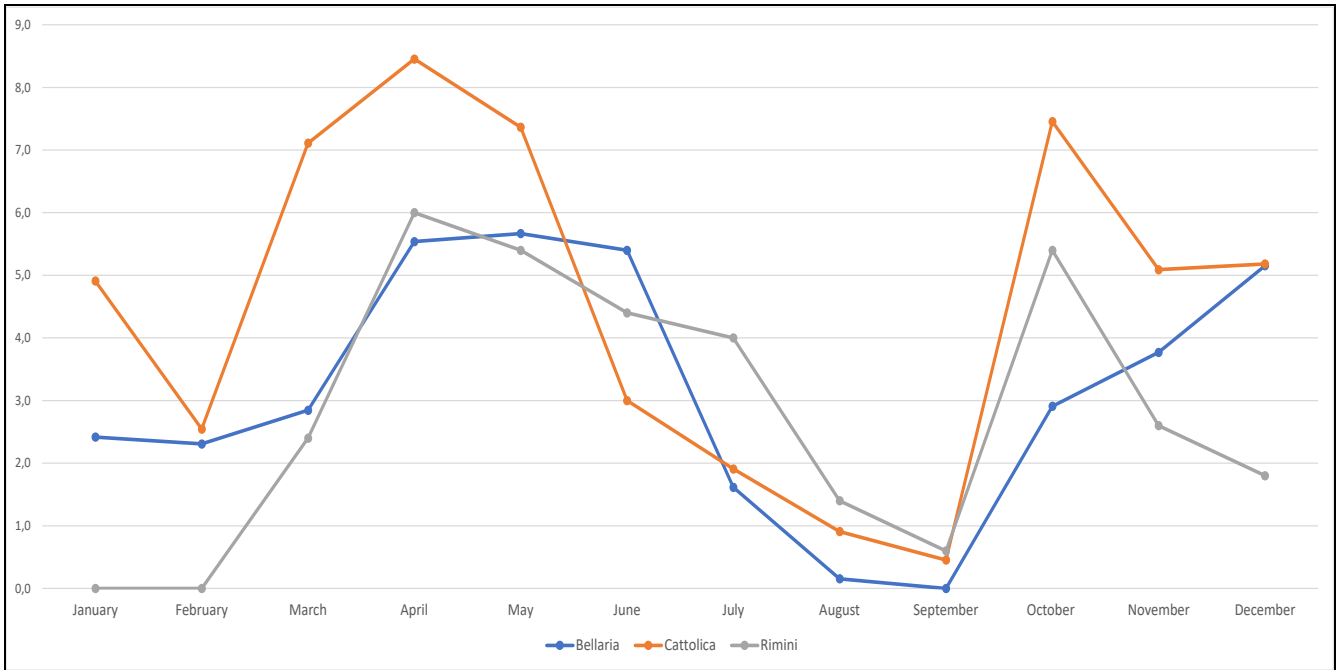


Figure 31 – Average number of monthly fishing days per port; 2018

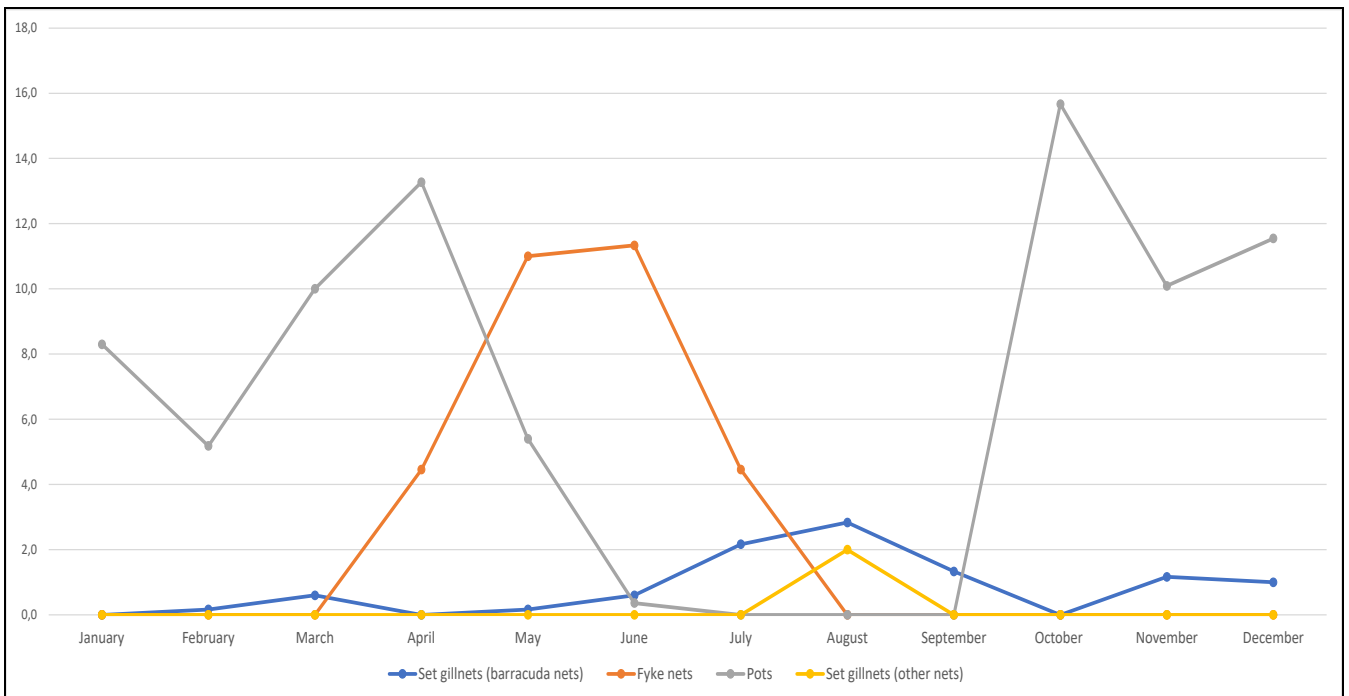


Figure 32 - Average number of monthly fishing days per gear in use; 2018