

Adri.SmArtFish

WP3- Evaluation of the Small-Scale Fishery sector

D3.3.1. REGIONAL REPORT ON SSF STATUS_CROATIA

WP3

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INTRODUCTION

The Adriatic Sea, as part of the Mediterranean Sea, shares with that region all common characteristics in terms of geographical features, available marine resources, their type and intensity of exploitation. Moreover, those fisheries functioned in the very specific socio-economical and historical contexts. All Mediterranean coastal areas have high diversity of littoral benthic communities at very small spatial scale which implies high biodiversity and trophic complexity (Stagličić et al., 2011). Since ancient times fishing has played a role in shaping the Mediterranean food webs, becoming more and more crucial at present times (Farrugio et al., 1993; Sala, 2004; Guidetti et al., 2010) as the booming growth of human populations along Mediterranean coasts necessitates ever larger harvests of marine resources (Goñi et al., 2000; Juanes, 2001). The very characteristics of such fishery, i.e. numerous fleet using diverse fishing gears, multi species catches and extremely heterogeneous landing sites and marketing, put scientific research in a particularly complex context (Farrugio et al., 1993). In that manner Croatian artisanal fishery is without exception a typical Mediterranean example. Thus, it has to be emphasized that in spite of artisanal fisheries importance and the extent of impacts it has on littoral ecosystems, it has been poorly investigated until now (Lleonart & Maynou, 2003; Battaglia et al., 2010).

According to its geographical position, the Republic of Croatia is a Mediterranean, Middle-European, Balkan, and Danubian country with approximately 4.3 million inhabitants. Overall surface and sea area is 89.810 km², out of which 33.200 km² are coastal waters. Croatia has a well-indented coast comprised of 1246 islands, out of which 67 are inhabited. Overall length of Croatia's coastline is 5835 km, out of which 1777 km is the length of the mainland coast, and 4058 km is the length of the coast of Hvar's islands. Croatia is administratively divided into 20 regions/counties, out of which seven are located on the coast (Fig.1A). Croatia's fishing sea includes internal waters, territorial waters and protected ecological fishery zone (ZERP). For the purpose of managing with live, renewable resources in the sea, the fishing sea is divided into fishing areas, by which managing and gathering of fishing data is carried out. (Fig.1B). Moreover, the largest part belongs administratively to GSA 17 (Fig.1C).

The fishing sea of Croatia is administratively divided into eleven (11) fishing zones and thirty-seven (37) fishing subzones. Out of eleven (11) fishing zones, four in the inner fishing sea of Croatia are parts of zone A and zones E, F and G, while in outer fishing sea is part of zone A and zones B, C, D, H, I, J and K. Administrative division of the fishing sea is used for the purposes of management and data collection.

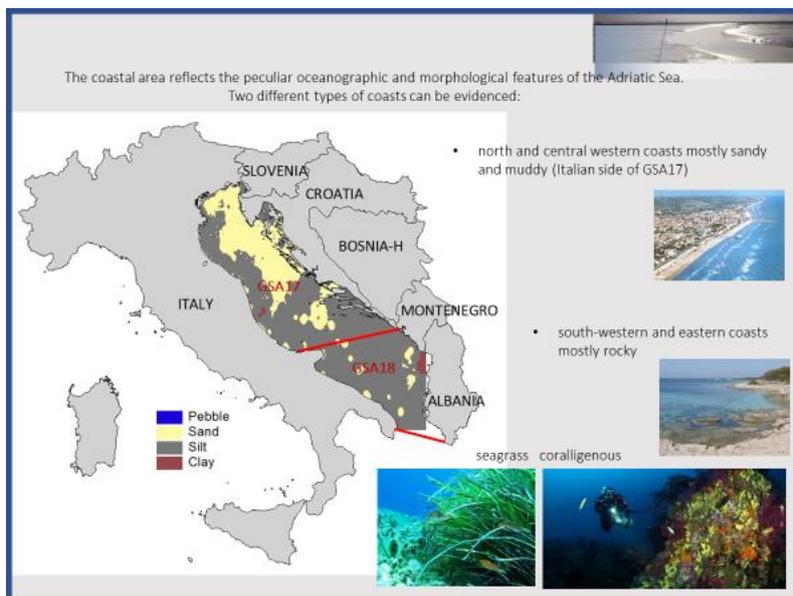
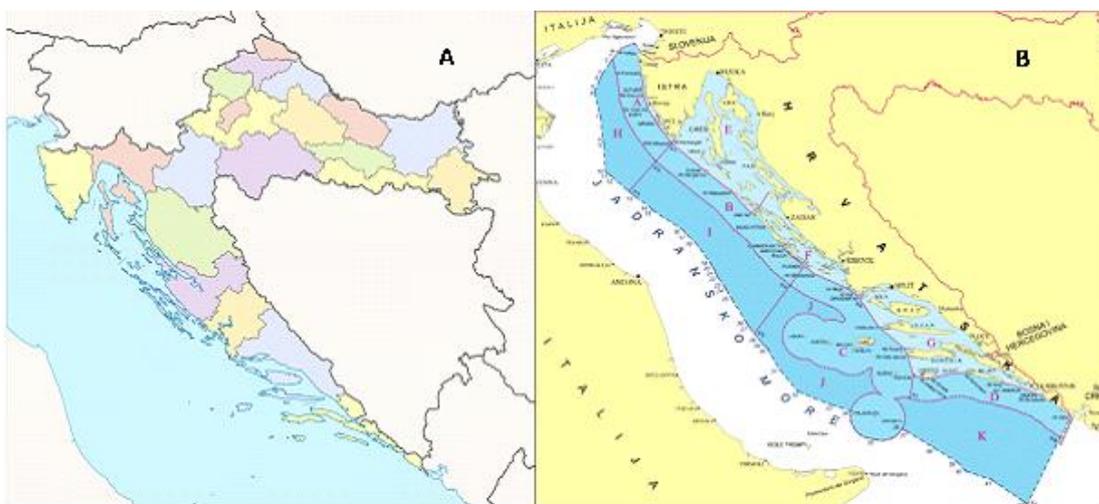


Figure 1. Counties in the Republic of Croatia (A) and administrative division of fishing sea of the Republic of Croatia (B) and according to GFCM (GSA 17) (C).

1.1. Marine fishery in Croatia

Fishery and aquaculture represent significant economic activities for Croatia with particular emphasis on social and economic sustainability of rural areas of coast and islands. Total catch of Croatia’s fishing fleet in 2017 was 69.476 tons, and total income of 2016 catch estimated at EUR was 70.2 million (STECF 18-07). However, official statistics of Fisheries Directorate (FD) shows the annual landing is stable at about 70,000 t of which 90% are landing of small pelagics while artisanal landings contribute by only 1%. This contribution is for sure underestimated since the majority of artisanal landings go unreported.

By far, the largest percentage of the catch is made by purse seines (> 90%), which constitutes only 3.5 percent of total number of the fishing vessels. Demersal trawls and dredges account for some 8% of the vessel number and 6% of the catch, while SSF accounted for 1.6% (STECF 18-07) of total catch landings covering 12 % of total value of landings (6.85 million EUR).

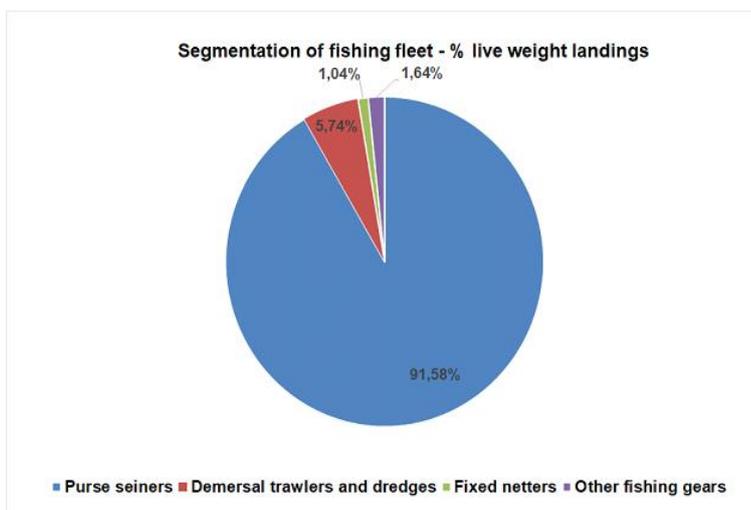
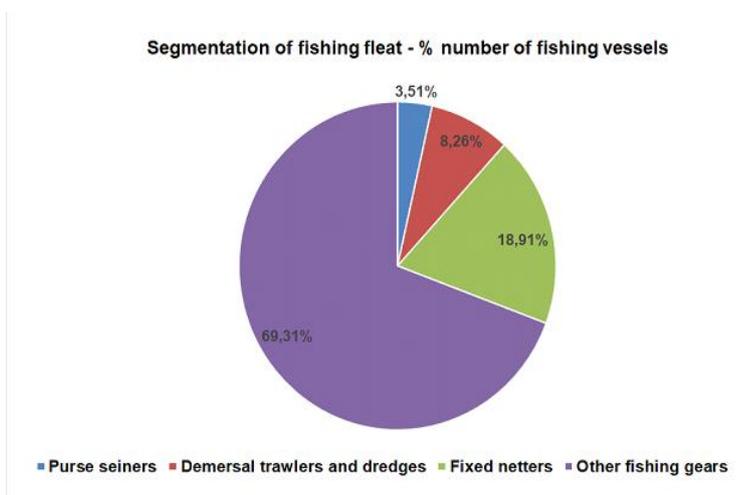


Figure 2. Share of number of fishing vessels and landings in 2017 by fleet segments.

There are two main types of marine fisheries in the Republic of Croatia: commercial and non-commercial ones. Commercial fisheries encompass commercial fisheries *sensu stricto* and a new category of small coastal fishery, limited in terms of gears and method of operation, while non-commercial ones include sports and recreational fisheries. Additionally, the Fisheries Act (Official Gazette No. 81/2013) further distinguishes fishing for scientific purposes and tourism.

Table 1. Overall fleet characteristics in 2017 (on 31. December 2017)

Vessel length	Total GT	Total kW	Total no. vessels
VL0006	3.774,88	37.702,84	4.154
VL0612	10.122,56	167.877,94	2.831
VL1218	6.236,36	56.321,56	348
VL1824	7.535,76	32.313,90	111
VL2440	17.931,93	61.577,90	115
TOTAL	45.601,49	355.794,14	7.559

The Fishing Fleet Register of Croatia currently (on 31. Dec 2017) includes 7559 vessels. However, all national reports for 2014 indicate a number of 4385 vessels (this number includes all vessels active during that year). This discrepancy is the consequence of the inclusion of 3,500 vessels (small coastal fishery) in the Fleet Register. The largest percentage of the fleet (over 90%) is comprised of vessels less than 12 m LOA, which also constitute the largest segment of the fleet's capacity in terms of power (some 60% kW). However, around 15% of vessels in this category (< 12 m LOA) belongs to small coastal fisheries and are probably inactive or rarely active. The bulk of the total tonnage of the Croatian fishing fleet refers to purse-seiners, while multipurpose vessels comprise the largest part of total power. The fleet contains 574 vessels, or 7.59% with LOA > than 12 m. The majority of vessels are registered as multipurpose vessels (over 45%), where fishers target assemblages rather than single

species and where gears are changed several times during the year. Purse seiners account for some 8% of fleet, but they are the most important fleet segment in terms of landing percentage (over 91% of total landings in 2014), while bottom trawlers account for some 17% of the fleet.

Prior to its accession to the EU, Croatia had a very specific category of non-commercial fishery called “small-scale fishery for personal needs” or subsistence fisheries that pursuant to the regulations in force required registration in the commercial category after Croatia acceded to the EU on the 1st of July 2013. The key distinguishing features between commercial and subsistence fishers were the purpose of their activity, type and quantity of fishing gear allowed, and daily catch limits. Commercial fishing is a profit-making activity, while fish and other marine organisms caught in the course of subsistence fishing were not to be placed on the market and were intended solely for **personal use**. This category accounted for around 11,000 vessel licence holders before 2013. Following the accession negotiations, from the aforementioned total, 3,500 vessels are now included in the fleet register and are called “small coastal fishery”. The remaining number of subsistence fishers either joined the recreational category of fisheries or became inactive, as many of these licence holders were neither full-time fishers nor depended on fishing for their livelihoods. Due to prolonged administrative and legislative procedures, the transition process of their full registration only ended in April 2015. Thus, since then, the subsistence fishery category has ceased to exist.

Advanced age (> 60 years old) and poor social status (monthly income < 400 EUR) were the basic conditions for receiving “small coastal fishery” licences. Due to these prerequisites, new commercial licence holders find it hard to fulfil their obligations as professionals (e.g. keeping accounts, invoicing, etc.). Therefore, being unable to comply with all the legal requirements, many small coastal fishers do not work in fisheries anymore but are reorienting their efforts more towards tourism-related activities. Those who opted for recreational fisheries are also disappointed as this fishing category prohibits the use of any kind of net and restricts fishers exclusively to hook and line fishing tools. With these requirements, most coastal inhabitants have felt forced to give up the tradition they believed they had been entitled to since time immemorial.

Sports and recreational fisheries in Croatia are regulated by the Marine Fisheries Law and related ordinances, and a permit (daily, multi-day, annual) is needed to engage in them, whether from shore or boat. These permits can be purchased from authorized dealers, in the regional offices of the Fisheries Department or electronically from their website. Annual permits for islanders over 65 years of age can be issued free of charge. Sports and recreational fisheries are allowed to fish along the eastern Adriatic coast, but they are prohibited around aquaculture facilities (within 200 metres of fish farms or 100 metres of shellfish farms), and from ports, harbours, and on the beaches from May to October. In special habitats (estuaries) and marine protected areas, certain forms of sports and recreational fisheries are strictly regulated or prohibited. The types and quantities of fishing gears and equipment (mostly longlines, jigs, traps) that fishers are allowed to use are also strictly prescribed.

Data dealing with recreational fishing are generally rare, since no requirements exist for the reporting of recreational fishing in Croatia, despite this having been a very popular activity for decades. Much of the resident population, as well as a growing number of visiting tourists, engage in it. The number of recreational fishers in Croatia was reported to stand at around 25,000 from 1979 to 2007, but in the last couple of years, expert opinion suggests that the number of recreational fishers is three times higher, especially during summer months (cca. 75,000).

Baseline regulation governing fisheries issues in Croatia is Fisheries Act (OG 81/2013), which in essence allows for the implementation of the EU acquis. It also contains the main administrative elements, specifying the key main bodies involved and their activities. Pursuant to this Law, several ordinances detailing the governance of different issues have been drafted and adopted in the last 3 years.

SSF IN CROATIA

At the EU level, there is no clear, uniform, and straightforward definition for SSF. For the purposes of the European Maritime and Fisheries Fund (Regulation (CE) N° 508/2014, "small-scale coastal fishing" (SSCF), was formally defined as fishing carried out by fishing vessels of an overall length <12 metres and not using towed gear. In other words, SSFC comprises typically "artisanal" and coastal commercial fishery using small boats which use traditional passive gears and small purse seine nets. This fishery is mostly carried out within a distance of a few nautical miles from the mainland and island coasts, since the majority of fishers embark on one-day fishing trips, and at depths no greater than approximately 80 m.

According to the definition for SSF from Regulation (CE)N° 508/2014 this segment of fishing fleet in the Republic of Croatia had 1972 of vessels in 2016 and 1883 vessels in 2017 (95,5% in comparison to 2016) (Table 2). Average length of these vessels is only 7 m and average age 35 years, which limits their fishing activities to fishing grounds near the port and to one-day fishing trips

Table 2. The number of vessels, catch and worth of the catch on landing for SSF (According to the definition from Regulation (CE) N° 508/2014).

Year	2016	2017
No of vessels	1972	1883
Landings (tonnes)	1884	1651
Landing value (€)	10.787.686	9.569.010

Rich fishing tradition of eastern Adriatic artisanal fishery is fully reflected in this typical Mediterranean multi-species and multi-gear fisheries sector employing more than 50 different types of fishing gear to catch about 150 different species of commercial interest (Cetinić et al., 2002). Artisanal fisheries is carried out within the distance of one nautical mile

from the mainland and islands coasts, in the shallow water at the depth of no more than approximately 80 m which represents a little more than 3% of the total surface of the Adriatic. The majority of commercially significant fish and invertebrate species live within this small area of the Adriatic Sea. Diversely constructed types of gill nets, trammel nets, combined trammel-gillnets, pots, long-lines, hooks and lines, filter nets, surrounding nets, lift nets, falling gear, entangling nets, barrier gear, harvesting machines, grappling and wounding, fishing using ropes (tramata fishing) are used in this zone by SSF.

SSF vessels predominantly use different types of fixed nets (gillnets and trammel nets) and operate from the shore and in coastal waters, in limited areas and during limited periods. Regional differences, conditioned by the distribution of target species, exist in frequency of their use. While, in west coast of peninsula Istra (northern Adriatic), trammel nets of smaller height called “listarice”, with *Solea vulgaris* as main target, are the main trammel nets used in winter, in middle and south Adriatic trammel nets called “poponice” are prevalent. The most important segment in this gear class is the one between 6 and 12 metres LOA, involving 673 vessels, representing over 25% of the fleet. They land mostly sole (21%) and a mixture of other demersal species (hake, cuttlefish, sea breams, common octopus). Out of the total catch, fish represent 96%, cephalopods make up around 2%, and crustaceans and shellfish another 2% (Directorate of Fisheries 2015). Trammel nets have traditionally been the favoured fishing gear of Croatia’s artisanal fishermen as they regard it as the most efficient one providing them with catches as lush as possible. Although, artisanal fisheries are generally perceived as highly efficient low impact fisheries that generate few discards (Stobart et al., 2009 and references therein), this fisheries affect numerous species due to continuous substantial fishermen practice, despite having preferred target species. Illustrative of the aforementioned, trammel nets are often target specific, but important part of the catch consists of multi-species by-catch (Stergiou et al., 2006).

However, the average prices of SSF products, intended almost exclusively for fresh consumption, are five to ten times higher than those of species caught by industrial fisheries. Moreover, these catches are probably underestimated, as illegal, unregulated and unreported (IUU) landings often occur in demersal and small-scale fisheries. The reconstruction of total catch estimated the IUU component to be as high as 43% (Matić-Skoko

et al. 2016) with discards within the demersal fisheries and non-reporting of SSF catches being the main reason for the discrepancy. This highlights that the current method of fishery catch reporting is inadequate and incomplete, and more comprehensive reporting, which includes all fishing sectors is necessary to provide more accurate estimates of total catches.

Despite SSF not being very economically significant (Table 3), they do have great social importance, simply because such a large number of fishing vessels cannot be ignored. Analysis of the economic data collected under the Data Collection Framework for the reference year 2013 shows that SSF accounted for only 1.6% of total landing (Fisheries Directorate, 2015) but, as explained above, most landings were probably largely unreported and consequently their financial value too. Days at sea in SSF have a distinct seasonal character, depending on the migration of target species to the inshore area during the warmer period of the year. Data from 2013 show that, on average, multipurpose vessels have around 70 days at sea per fishing gear during the year (Fisheries Directorate, 2015). As SSF combine working with fishing gears on a seasonal basis, the total number of working days is higher than for each individual gear, as is the total catch. Furthermore, the number of days at sea is probably underestimated, since every fishing day is not registered in the logbook by SSF fishers. Most SSF catches are sold on the local market, not in Prud' homies or in Cofradías auctions, as in France and Spain, and the income is often used as a supplement to the household budget. For some small-scale fishers, profit is not even a priority, since they have other sources of income (e.g. agriculture or tourism). Despite the limited importance of catch quantities, SSF make a substantial contribution to employment among the rural population on islands and along the coast, particularly during the summer months, and during the winter fishing is mainly intended for personal consumption.

For sure, relatively small landing and total worth of landed catch by landing unit (around 5000 € per year) does not give good insight into this segment of fishing. As it mentioned earlier, a large number of SSF fisher engages in fishing activity only during the season. Regarding the fact that the average size of the vessel is 7 meters (Table 4), the number of days in year in which weather allows fishing activities is also a constraint. Days at sea in SSF have a distinct seasonal character, depending on the migration of target species to the inshore area during the warmer period of the year.

Table 3. Differences in catch and value achieved by small-scale and large-scale fisheries in Croatia

Size of the fishery enterprise	Quantity	2013	2014	2015	2016	2017
Small-scale fisheries	Volume (tonnes)	1,496.9	1,612.3	1,810.7	1,753.5	1,633.63
	Value (LC)	62,882,694.2	66,393,649.5	76,081,891.6	76,502,856.8	71,155,313.4
Large-scale fisheries	Volume (tonnes)	73,423.5	77,801.6	71,097.6	70,570.1	67,241.1
	Value (LC)	395,994,201.6	404,482,216.1	388,180,939.6	360,578,602.5	348,754,401.4

*local currency (kn)

Table 4. Vessels composition of small-scale fisheries in Croatia according to LOA category in period 2013-2017

Size of the fishery enterprise	Motor	LOA category	2013	2014	2015	2016	2017
Small-scale fisheries	Motorized	0 - 12 m	3330	3418	6816*	6585	7216
		12 - 24 m					
		> 24 m					
	Non-motorized	0 - 12 m	64	66	59	221	253
		12 - 24 m					
		> 24 m					

* Small-scale subsistence fisheries are included in commercial fisheries (as a special category) from 2015. Prior to 2015 these vessels (3500 vessels) were non-commercial vessels, therefore they are not included in the figures for the period 2013-2014. Active and inactive vessels are included.

To better understand the SSF structure in the Republic of Croatia, simple data analyses was conducted for SSF about the number of participants, catch and earned value on the first sale according to the sector segmentation which was created for two criteria (and also Table 4):

Three groups of fishers according to the **fishing activity** (number of fishing days)

1. <70 fishing days
2. 20 – 70 fishing days
3. > 20 fishing days

Three groups of fishers according to the **income of the first sale**

1. <20 000 €
2. 10 000 – 20 000 €
3. >10 000 €

Table 5. Hierarchical analyses of the number of SSF vessels, catch and income of the first sale in 2017 in the Republic of Croatia according to the criterion of the fishing activity and yearly obtained income of the first sale.

SSF segmentation	No of vessels	Catch (t)	Value (€)
>70 fishing days/ year	724	1.169,1	6.818.846,4
20 - 70 fishing days/ year	781	424,6	2.426.775,5
<20 fishing days/ year	378	57,2	323.388,5
TOTAL	1.883	1.650,8	9.569.010,4
>20 000 €/year	870	638,3	3.784.787,3
10 000 - 20 000 €/year	117	232,8	1.586.007,1
<10 000 €/year	896	779,7	4.198.216,0
TOTAL	1.883	1.650,8	9.569.010,4

The highest SSF fishing activity was registered in the Istra County and the lowest in the Ličko-Senjska County (Fig. 3).

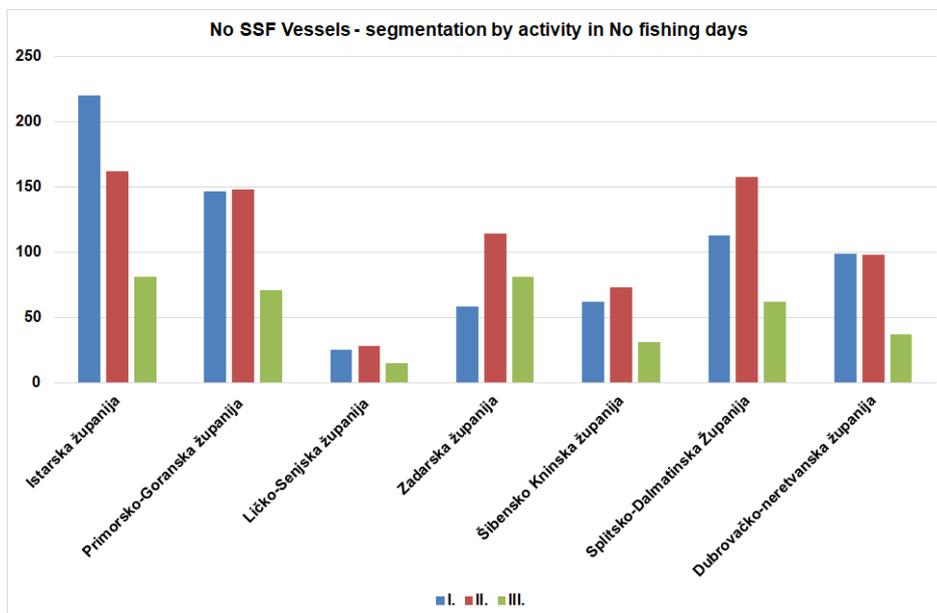


Fig. 3. SSF fleet activity by counties in 2017. Number of active vessels is divided in three categories: 1. > 70 fishing days; 2. 20-70 fishing days; 3. <20 fishing days.

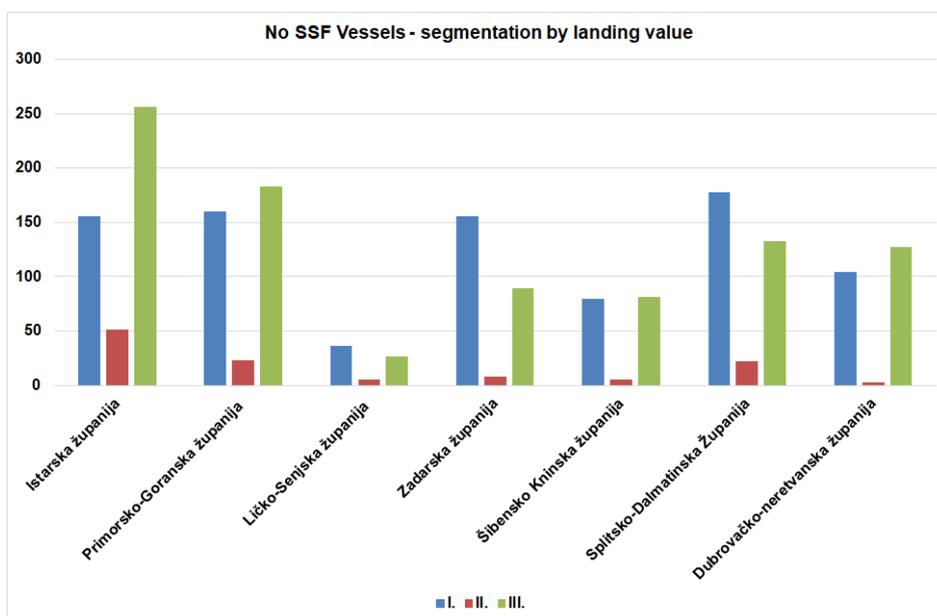


Fig. 4. SSF fleet segmentation by counties in 2017- number of vessels by landing value of the catch. The vessels are divided in three categories according to the landing value: 1. >20 000 €/year; 2. 10 000 – 20 000 €/year; 3. <10 000€/year

The segmentation of SSF fleet according to the criterion of landing value of the catch (Fig. 4) clearly separates SSF fishers in two categories: category which generates substantial part of the income from fishing and a part of fishers to whom fishing is a secondary activity which they undertake as a supplement to other commercial activities (tourism, agriculture). For the second group, fishing represents a significant additional commercial activity, on which economic viability of combined domestic economies on islands and littoral zone is dependant upon. In those terms, calculation of profitability cannot be only conducted through the analyses of fishery activity. Even though low profitability is indicated for the fleet, with very low landing values, fixed nets segments are considered to be primarily highly artisanal and important in terms of social and economic elements for local population and communities. Additionally, the economic viability of these fisheries is, without doubt, compensated by continuous increases in fish prices in general (around 30% in the last decade).

SSF have always involved large numbers of fishers, reflecting Croatia's rich fishing tradition similar to other Mediterranean countries. The number of SSF fisher in the Republic of Croatia has not increased since 2009. It is because Croatia has stopped the increasement of the number of the licences for commercial fishery, for the purpose of protecting the resources. Usually, just one or two fishers work on SSF vessels (mainly the owner and close family members). Unfortunately, the number of women involved in fisheries is not possible to estimate with a great accuracy. Number of employees in the SSF is from 2455 (2013) to 5756 (2017). The increase in the number of fisherman in last 2 years is due to the inclusion of previously non-commercial category in commercial fisheries. Certainly, a number of women are involved in the sector (both fishing and sales), particularly in SSF. However, they are not usually registered as employees. Also, a number of women are registered as owners of vessels for socio-economic reasons (around 15%) and/or are involved in land-based activities related to fisheries (e.g., repairing nets, catch distribution and sale, accounting services...). If SSF diminish over time, it would cause a substantial shortage of income-generating labour in rural areas, as well as a reduced supply of healthy food on the islands, especially in the winter months. Additionally, during summer months, tourism along the coast and on islands in Croatia is a significant economic activity and SSF products play an important role as new markets emerge. Moreover, SSF associated with tourism provide an added value to tourism

services, though currently, there are no estimations of fisheries' contribution to this value. However, these fisheries do fit well within the national strategic guidelines for tourism development; the aim of which is to develop the tourism offer on the basis of high-quality services. Most of the mariculture infrastructure in Croatia is directly related to islands, and this also significantly influences the development and sustainability of vulnerable island communities. Areas and communities traditionally dependent on fisheries, still having the characteristics of 'fishing villages', especially on the islands, represent a significant asset in terms of overall tourism development. Similarly, SSF have significant cultural value and as such are part of the identity of the islands' populations.

The changes to Croatia fisheries since joining the EU were dramatic. SSF think the fishing profession is not involved in the decision-making processes and perceive that Croatian Fisheries interests are not well represented in the EU. They are mostly familiar with the concept of CFP, but they have voiced doubts that Croatia is obliged to incorporate all the provisions arising from the CFP into national law and that national legislation can only be more stringent than those laid down in Council Regulations. The vast majority considered that EU member states should not have uniform fisheries policies and that transition periods for policy changes should not be the same in all EU countries. They wish for their individuality and specific traditions to be recognised. Legislative changes in fisheries make them uneasy as they feel that scientific support is generally lacking, and the changes are so numerous and introduced within insufficient time to adjust and organize. Moreover, implementation and compliance with regulations is perceived not to be high.

Limited institutional capability to effectively conduct surveillance and monitoring of fishing activities, particularly in the case of small-scale fishers (large number of landing ports, inspections not frequent enough and fines not high enough to force compliance) certainly implies that a certain proportion of the total catch goes as unreported, ending up directly in restaurants or on the black market. Since economic indicators from SSF, such as catch rates, suggest low profitability, there is obviously a discrepancy between the official statistics and reality. It can be clearly seen that SSF contribute to the food supply and economies of Croatian coastal communities (especially on islands during winter months) and thus SSF revenue is probably sufficient not to force fishers to leave the profession. Evidently, fishers' individual

resilience and adaptive capacity are based on their confidence in their skills, their coping ability and their ability to assess risks as suggested by Marshal and Marshal (2007).

2. SSF IN CROATIA

2.1. ISTRA COUNTY

In the Istra County catches made by all fishermen are landed at 71 landing places with total landings of 7,924.3 t. A total of 407.9 tonnes was reported in 2018 for SSF on the 59 landing places. The most important SSF landing ports are: Umag (57.2 t), Poreč (42.9 t) and Savudrija (41.4). In total, almost 60 t (14.7 %) were landed out of any landing place (direct sales from boats).

Table 6. Total number of vessels in the Istra County within categories < 6 m and 6 -12 m

ISTRA COUNTY	Year	Number of vessels	Landings
<6m	2018	79	171.2
6-12m	2018	218	7,753.5

In general, 297 vessels (< 6m) landed 171.2 t while 218 vessels were in category of 6-12 m and they landed 7,753.5 t.

In total, landings were composed of 104 different species of fish and other marine organisms. Two fish species, *Solea vulgaris* (93.0 t), *Sparus aurata* (42.9 t) and Mugilidae (7.1 t) were listed as those with highest landings, following by bivalve *Venus verrucosa* (45.0 t).

2.2. RIJEČKO-GORANSKA COUNTY

In the Riječko-Goranska County catches made by all fishermen are landed at 99 landing places. A total of 8,096.2 tonnes was reported in 2018. Of these, the catches made by SSF fishermen

amounted to 211.9 tonnes (5.16 %), and these catches were landed in 73 landing ports. The most important SSF landing ports are: Rab (30.6 t); Mali Lošinj (25.0 t) and Rijeka (14.2 t). In total, 35.7 t (16.8 %) were landed out of any landing place (direct sales from boats).

Table 7. Total number of vessels in the Riječko-Goranska County within categories < 6 m and 6 -12 m

RIJEČKO-GORANSKA COUNTY	Year	Number of vessels	Landings (t)
<6m	2018	58	76.5
6-12m	2018	101	135.4

In general, 58 vessels (< 6m) landed 76.5 t while 101 vessels were in category of 6-12 m and they landed 135.4 t.

In total, landings were composed of 102 different species of fish and other marine organisms. Two fish species, *Nephrops norvegicus* (36.8 t), *Octopus vulgaris* (26.8 t) and *Merluccius merluccius* (19.9 t) were listed as those with highest landings, following by collecting bivalve *Callista chione* (13.9 t) and sea urchins (9.8 t).

2.3 ZADAR COUNTY

In the Zadar County catches made by all fishermen are landed at 41 landing places. Total landings in Zadar County, in 2018, was 23,653 tons, of which 97.8% was small pelagic fish. The landings of other species were 512 tons in which SSF fleet participated with 217,8 tons (42,5%). The most important SSF landing ports are: Pakoštane (20.1 t), Zadar- Gaženica (12.0 t); Privlaka (11.6 t). The value landed by SSF exceeds 2.5 million of euro which is about 35% of total landed value in Croatia

Table 8. Total number of vessels in the Zadar County within categories < 6 m and 6 -12 m

ZADAR COUNTY	Year	Number of vessels	Landings (t)	Value of first sale
<6m	2018	109	42.6	369.725,40
6-12m	2018	178	167.5	2.902.824,30
<6m	2017	100	35.1	441.830,50
6-12m	2017	167	121.6	2.483.583,15

In total in Zadar County 287 SSF vessels are operating and about 40% of SSF fishing vessels have overall length less than 6 meters (109). They landed 42.6 t while 178 vessels were in category of 6-12 m and they landed 167.5 t. The activity of fishing fleet can be reported directly by the number of days at sea or indirectly by the relative quantity of landings of fishing the vessels. It seems that 18% of active vessels (140 vessels) realise 75% of total landings in Zadar County while 28% (61 vessel) were practically inactive. The fishing activity of SSF fisherman during 2018, varied between 5 and 20 days at sea monthly (Figure 5). The fishing activity was limited by the size of the vessel and weather, but also by the the market requests. Thus, the number of days in winter is 30 % lower than in warmer part of the year.

Average number of days at sea per month

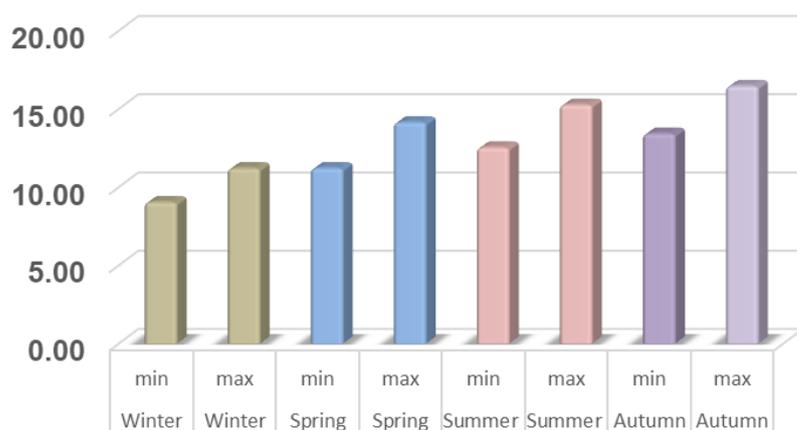


Figure 5. The average number of days at sea per month of SSF fleet of ZC by seasons. *Source: the survey (43 fisherman) conducted for the purpose of project*

On the other side grouping of landing places by logistics criteria (Figure 6) revealed that the landings on the islands landing places, account for 40% of total landings in Zadar County.

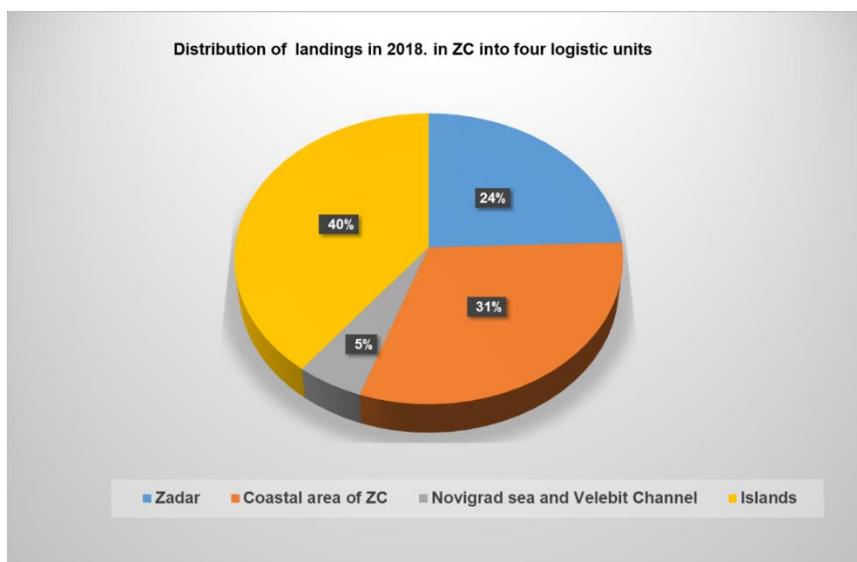


Figure 6. The distribution of landings into for logistic units: ports of Zadar, ports of the coastal area of ZC, Novigrad Sea-Velebit Channel and Islands. *Source: Fisheries Departement*

The prevalent fishing gears used in SSF fishery of ZC are fixed nets (trammel nets and gillnets) which is in accordance with the observation of STECF. The traps for Norway lobster are used in the restricted area of Velebit Channel and hooks are the only fishing gear for tuna fishing are used only by the restricted number of authorised fishermen.

In total, landings were composed of more than 100 different species of fish and other marine organisms. Next species: *Octopus vulgaris* (30.8 t), *Sparus aurata* (27.9 t) and then *Sarpa salpa* (14.8 t), *Sepia officinalis* (13.7 t) and *Merluccius merluccius* (11.7 t) were listed as those with highest landings.

2.4. ŠIBENSKO-KNINSKA COUNTY

In the Šibensko-Kninska County catches made by all fishermen are landed at 21 landing places. A total landings, made by SSF fishermen amounted to 171.9 tonnes. The most important SSF landing ports are: Tribunj (24.0 t); Jezera (18.4 t) and Rogoznica (16.7 t).

In general, 58 vessels (< 6m) landed 60.9 t while 125 vessels were in category of 6-12 m and they landed 111.0 t.

In total, landings were composed of 98 different species of fish and other marine organisms. Next species, sea urchins (47.8 t), *Sparus aurata* (12.8 t), *Thunnus thynnus* (26.6 t) and *Merluccius merluccius* (10.9 t) were listed as those with highest landings.

Table 9. Total number of vessels in the Zadar County and Šibensko-Kninska County within categories < 6 m and 6 -12 m

ŠIBENSKO KNINSKA COUNTY	Year	Number of vessels	Landings (t)	Value of first sale
<6m	2018	58	60.9	1.305.393,20
6-12m	2018	125	111.0	2.893.912,30
<6m	2017	56	41.2	535.486,75
6-12m	2017	111	69.4	1.772.523,09

2.5 SPLITSKO-DALMATINSKA COUNTY

In the Split-Dalmatia County, catches made by all fishermen are landed at 126 landing places. A total of 15,130.25 tonnes was reported in 2018. Of these, the catches made by SSF fishermen amounted to 369.23 tonnes (2.44%), and these catches were landed in 81 landing ports. The most important SSF landing ports are: Komiža (132.3 t); Kaštel Kambelovac (66.2 t) and Hvar (19.1 t). In total, 31.3 t were landed out of any landing place (direct sales from boats).

Table 10. Total number of vessels in the Splitsko-Dalmatinska County within categories < 6 m and 6 -12 m

SPLITSKO- DALMATINSKA COUNTY	Year	Number of vessels	Landings (t)
<6m	2018	44	120.3

6-12m	2018	91	248.9
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In general, 44 vessels (< 6m) landed 120.3 t while 91 vessels were in category of 6-12 m and they landed 248.9 t.

In total, landings were composed of 103 different species of fish and other marine organisms. Two fish species, *Merluccius merluccius* (98.7 t) and *Trigla lucerna* (37.5 t) were listed as those with highest landings, following by collecting sea urchins (30.1 t) and mussels (*Mytillus galloprovincialis*, 26.7 t).

In the Dubrovačko-Neretvanska County catches made by all fishermen are landed at 76 landing places. A total of 2,736.27 tonnes was reported in 2018. Of these, the catches made by SSF fishermen amounted to 141.13 tonnes (5.16 %), and these catches were landed in 60 landing ports. The most important SSF landing ports are: Dubrovnik-Gruž (17.9 t); Sobra (10.6 t) and Zaklopatica (8.8 t). In total, 16.7 t were landed out of any landing place (direct sales from boats).

Table 11. Total number of vessels in the Dubrovačko-Neretvanska County within categories < 6 m and 6 -12 m

DUBROVAČKO- NERETVANSKA COUNTY	Year	Number of vessels	Landings (t)
<6m	2018	46	62.1
6-12m	2018	67	79.0

In general, 46 vessels (< 6m) landed 62.1 t while 67 vessels were in category of 6-12 m and they landed 79.0 t.

In total, landings were composed of 92 different species of fish and other marine organisms. Two fish species, *Merluccius merluccius* (10.9 t), Mugilidae (9.0 t), *Scorpaena scrofa* (7.1 t)

and *Sparus aurata* (6.5 t) were listed as those with highest landings, following by collecting sea urchins (9.8 t).

3. CONCLUSIONS

1. In total 1074 SSF vessels reported activity in 2018. Majorities of them are in Istra County (27.7 %), while Split and Zadar are almost identical in number of vessels. The most important segment vessel class is the one between 6 and 12 metres LOA. Total reported landings were 1519.8 t, with highest achieved in Istra Region (26.8 %).

regions	no. SSF vessel	total landings	no. landing port
Istra	297	407,9	59
Rijeka	159	211,9	73
Zadar	187	217,8	41
Šibenik	183	171,9	21
Split	135	369,2	81
Dubrovnik	113	141,1	60
total	1074	1519,8	335

2. Obviously, a high number of landing places were recorded as those were SSF landed their catches. However, in total, more than 15 % in each region were landed out of any landing place (direct sales from boats).
3. SSF vessels predominantly use different types of fixed nets (gillnets and trammel nets) and operate from the shore and in coastal waters, in limited areas and during limited periods.
4. Regional differences, conditioned by the distribution of target species, exist in frequency of their use. While, in west coast of peninsula Istra (northern Adriatic), trammel nets of smaller height called "listarice", with *Solea vulgaris* as main target, are the main trammel nets used in winter, in middle and south Adriatic trammel nets called "poponice" are prevalent.
5. On average, multipurpose vessels have around 70 days at sea per fishing gear during the year. As SSF combine working with fishing gears on a seasonal basis, the total number of working days is higher than for each individual gear, as is the total catch.

Furthermore, the number of days at sea is probably underestimated, since every fishing day is not registered in the logbook by SSF fishers.

6. The segmentation of SSF fleet according to the criterion of landing value of the catch clearly separates SSF fishers in two categories: category which generates substantial part of the income from fishing and a part of fishers to whom fishing is a secondary activity which they undertake as a supplement to other commercial activities (tourism, agriculture). For the second group, fishing represents a significant additional commercial activity, on which economic viability of combined domestic economies on islands and littoral zone is dependent upon.
7. The dispersion of fishermen throughout coasts and numerous islands is an insuperable weakness that prevents SSF fishermen from meaningfully joining associations and acting in the direction of essential investments necessary to overcome the cold storage of fish for more than 24 ours. The alternative of individual investments in the approved establishment the alternative for most is not economically justified, and in many places impossible because of spatial planning restrictions.
8. Limited institutional capability to effectively conduct surveillance and monitoring of fishing activities, particularly in the case of small-scale fishers (large number of landing ports, inspections not frequent enough and fines not high enough to force compliance) certainly implies that a certain proportion of the total catch goes as unreported, ending up directly in restaurants or on the black market. Since economic indicators from SSF, such as catch rates, suggest low profitability, there is obviously a discrepancy between the official statistics and reality. It can be clearly seen that SSF contribute to the food supply and economies of Croatian coastal communities (especially on islands during winter months) and thus SSF revenue is probably sufficient not to force fishers to leave the profession.

4. REFERENCES

Battaglia, P., Romeo, T., Consoli, P., Scotti, G., Andaloro, F. 2010. Characterization of the artisanal fishery and its socio-economic aspects in the central Mediterranean Sea (Aeolian Islands, Italy). *Fish. Res.* 102, 87-97.

Cetinić, P., Soldo, A., Dulčić, J., Pallaoro, A. 2002. Specific method of fishing for Sparidae species in the eastern Adriatic. *Fish. Res.*, 55: 131-139.

Farrugio, H., Oliver, P., Biagi, F. 1993. An overview of the history, knowledge, recent and future trends in Mediterranean fisheries. *Sci. Mar.*, 57: 105-119.

Goñi, R., Polunin, N.V.C., *PLANES*, S. 2000. The Mediterranean: marine protected areas and the recovery of a large marine ecosystem. *Environ. Conserv.*, 27: 95-97.

Guidetti, P., Bussotti, S., Pizzolante, F., Ciccolella, A. 2010. Assessing the potential of an artisanal fishing co-management in the Marine Protected Area of Torre Guaceto (southern Adriatic Sea, SE Italy). *Fish Res*, 101: 180-187.

Juanes, F. 2001. Mediterranean marine protected areas. *Trends Ecol. Evol.*, 16: 169-170.

Leonart, J., Maynou, F. 2003. Fish stock assessment in Mediterranean: state of the art. *Sci. Mar.*, 67: 37-49.

Official Gazette No. 81/2013, Law on Marine Fisheries

Stagličić, N., Matić-Skoko, S., Pallaoro, A., Grgičević, R., Kraljević, M., Tutman, P., Dragičević, B., Dulčić, J., 2011. Long term trends in the structure of eastern Adriatic littoral fish assemblages: Consequences for fisheries management. *Estuarine, Coastal and Shelf Science* 94: 263-271.

Stergiou, K.I., Moutopoulos, D.K., Soriguer, M.C., Puente, E., Lino, P.G., Zabala, C., Monteiro, P., Errazkin, L.A., Erzini, K. 2006. Trammel net catch species composition, catch rates and métiers in southern European waters: a multivariate approach. *Fish. Res.*, 79: 170–182.

Stobart, B., Warwick, R., González, C., Mallo, S., Díaz, D., Reñones, O., Goñi, R. 2009. Long-term and spillover effects of a marine protected area on an exploited fish community. *Mar. Ecol-Prog. Ser.*, 384: 47-60

STECF 18-07, 2018. The 2018 Annual Economic Report on the EU Fishing Fleet (STECF 18-07). <https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/2018-annual-economic-report-eu-fishing-fleet-stecf-18-07>