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ECONOMIC AND SOCIAL IMPACT OF MARINE SPORT AND RECREATIONAL FISHERIES IN CROATIA

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ABSTRACT

Sport and recreational marine fishery can significantly contribute to the national budget through its economic and social effects. The main aim of this research is to define the economic and social significance of sport and recreational fishing in Croatia through the assessment of the lower limit of its economic value. This is done by analyzing the segments of sport and recreational fishing together with the economic and other activities which are closely related to it. When expressed by the number of stakeholders involved in sport and recreational fisheries and the share in the gross domestic product, it can be concluded that the economic effects of these activities are only slightly lower than in commercial fisheries. This research provides the groundwork for pointing out the basic guidelines of the social significance of sport and recreational marine fishery in Croatia. Hence, it can be noted that sport and recreational fishing in local coastal communities support the overall development of rural areas and the local communities in particular.

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INTRODUCTION

The total number of European recreational seawater fishers has been estimated at approximately 8.7 million, with 5.9 million and 2.8 million in the Atlantic and Mediterranean regions. The highest numbers of recreational sea fishers were from Norway and the United Kingdom in the Atlantic region, whereas the highest number of fishers in the Mediterranean were from Italy (Hyder et al., 2017). In the EU part of the Mediterranean, sport and recreational marine fishing is defined (Council Regulation (EC) No 1967/2006) as leisure fisheries, i.e. fishing activities exploiting living aquatic resources for recreation or sport. In the Republic of Croatia, the marine sport and recreational fishery (MSRF) is defined by the Marine Fisheries Act (Official Gazette No 56/10, 127/10, 55/11) as sport fishing for sport purposes and recreational fishing as fishing for recreation. Both fishing categories imply that license is required for performing these activities, but there are certain differences in legislation between these two categories in relation to fishing gear and

equipment used, the fishing technique and the targeted fish species. MSRF in Europe, as well as in Croatia, involves many different methods including both active (e.g. rod and line, spear and hand-gathering) and passive (e.g. nets, traps, pots and longlines) fishing gear. Hence, a broad range of species are targeted, including seabreams (*Sparidae*), labrids (*Labridae*), mackerels (*Scombridae*), flatfish (*Pleuronectiformes*), gadoids (*Gadidae*), European sea bass *Dicentrarchus labrax*, shell-fish, crustaceans, etc., with the importance of targeted species varying between countries. Although MSRF is thought to have significant impacts on many fish stocks (Arlinghaus and Cooke, 2005), impacts on the marine environment are difficult to assess due to the general lack of data from MSRF. Hence, it is known that MSRF can generate significant economic and social benefits (Arlinghaus and Cooke, 2009; Pawson et al., 2007), but the related data are quite scarce and incomplete, especially in Europe. Using the available data on marine recreational fisheries within EU member states, Pawson et al. (2007) made an evaluation of the environmental, social and economic importance of marine recreational fishery. At that time Croatia was not a member of the EU and, consequently, was not included in the assessment. Recent studies indicate that national economies can benefit through recreational fisheries significantly, based on the assessment that the total expenditure exceeds EUR 25 billion a year in the EU (Jobard et al., 2016). On the other hand, the latest study by Hyder et al. (2017) estimated total expenditure by recreational sea fishers to be EUR 5.89 billion in Europe, with around EUR 4.97 and EUR 0.92 billion spent in the Atlantic and Mediterranean regions, respectively. Although, a number of studies have been carried out with regard to catch analysis in Croatia, including the catch per unit effort (CPUE) as well as other fishery indicators (Soldo et al., 2005, 2006, 2007a, 2007b, 2007c, 2008, 2009; Soldo, 2011, 2013), there has been no data on the economic and social importance of sport and recreational fishing. The available literature on sport and recreational fishing at sea is a variety of manuals (Basioli, 1984; Cetinić and Milišić, 1987; Jardas et al., 1996; Šuljić, 1996; Žanko, 2003; Šerić, 2007; Felker, 2010) that only focus on the fishing methods using sport and recreational fishing gear. Economic impacts include direct, indirect and induced effects on the economy. Induced effects include not only the fisherman expenditure but also the total added value. Social effects can be calculated through a number of full-time employees based on fisherman expenditure (Jobard et al., 2016). The direct economic impact results from the money spent on activities in an observed area, the indirect impact results as a consequence of direct effects, while the induced impact results from direct and indirect effects. These induced effects may considerably increase personal income (Jobard et al., 2016).

There are several ways of economic assessment of the direct economic effect of the sport and recreational fisheries which cannot be easily expressed through market prices. First of all, there are methods of assessing the prosperity of sport and recreational fishermen in terms of observing and monitoring the changes in the value of property rights (expressed through the number and value of the license - Contingent Valuation Method), the method of assessment based on fisherman behavior in various fishing areas (travel and other costs associated with sport and recreational fishing activity) and by monitoring preferences of sport and recreational fishermen (Travel Cost Methods, TCM). The main aim of this research is to define the economic and social significance of the marine sport and recreational fisheries in Croatia trough the assessment of the lower limit of its economic value. This can be achieved by analyzing the segments of sport and recreational fishing together with economic and other activities that are closely related to it. Fishing license, sale of fishing gear and equipment, big-game fishing and production of vessels for sport and recreational fishing are activities closely related to sport and recreational fisheries and will be taken into account. Given its long Mediterranean coast and a high number of fishers involved in this activity, scarce data on the importance of marine sport and recreational fishery (MSRF) in Croatia were certainly a significant knowledge gap for the proper assessment of the MSRF in Europe. Thus, the results of this study will fill this gap and help address the challenges of monitoring and assessment of MSRF in Europe as well as in other regions.

MATERIAL AND METHODS

The direct economic effects of sport and recreational fishing at sea in the Republic of Croatia were calculated by taking into account the following variables:

1. number of sold licenses for sport and recreational fishing at sea,
2. trade in fishing gear and tools for sport and recreational fishing,
3. value of big-game fishing,
4. production of vessels for sport and recreational fishing.

Number of sold licenses for sport and recreational fishing at sea

The revenue accomplished by selling licenses for sport and recreational fishing in the Republic of Croatia was estimated on the basis of the number of licenses issued in 2011 and the amount of fees paid for their granting. The information on the number of licenses issued for sport fishing at sea in 2011 was obtained from the Croatian Marine Fishing Association, while the data on the number of licenses issued

for recreational fishing at sea in 2011, as well as special permits for big-game fishing (mainly tunas, *Scombridae*, swordfish, *Xiphias gladius* and *Tetrapturus belone,* Mediterranean spearfish) were obtained from the Ministry of Agriculture of the Republic of Croatia. The information on the amount of fees for granting licenses for marine sport and recreational fishing was found in the Regulation on sport and recreational fishing at sea (Anonymous, 2011). The revenues from granting licenses in the two categories of sport and recreational fishing were calculated by multiplying the number of issued licenses and the amount of fees required for their issuance. The total revenue from granting the licenses for sport and recreational fishing at sea represents the sum of the income generated by fishing categories.

Trade of fishing gear equipment for marine sport and recreational fishing

The indicators related to the trade of fishing gear used in sport and recreational fishing were estimated according to the annual financial statements for 2012, provided by two largest companies engaged in the wholesale and retail sale of sport and recreational fishing gear and equipment located in continental and coastal Croatia. During the research that included structured interviews and insights into the financial statements of representative legal entities in the wholesale trade (mainly fishing gear and equipment for MSRF), we estimated the approximate revenue that could be achieved by selling all the items purchased from companies engaged in the wholesale trade of sport and recreational fishing, the approximate total market value of fishing gear and tools in the Republic of Croatia, as well as the approximate total value added tax from the fishing gear and tool trade, paid in favour of Croatia's state budget. The value of the income, which could be achieved by selling all the items purchased by companies engaged in the wholesale of sport and recreational fishing equipment, was calculated by multiplying the value of the wholesale revenue with the retail margin, which amounts to an average of around 40% on the basis of the data obtained from the primary sources. The value added tax (VAT) is 25% of the retail revenue, while the value of the retail turnover includes the obtained revenue from retail sales increased by VAT. Estimated indicators of the direct overall economic impact of the sale of fishing gear and equipment in Croatia (sales revenue, VAT, turnover) were obtained on the basis of an estimated number of companies engaged in wholesale of fishing gear and equipment for MSRF. The number of companies engaged primarily in this wholesale trade was evaluated in accordance with the available data obtained from the Croatian Chamber of Commerce and Croatian Chamber of Trades and Crafts.

Value of big-game fishing

For the purpose of assessing the economic value of big-game fishing (fishing of tunas and swordfish) in the Republic of Croatia, data on the number of special licenses granted in 2011 were obtained from the Ministry of Agriculture, Fisheries and Rural Development, whereas the approximate amount of the total direct costs of big-game fishing was based on values determined by Ditton and Grimes (1995). The economic value of big-game fishing in Croatia was calculated as a sum of the revenues generated from the direct sale of special big-game fishing licenses and the estimated total direct cost of big-game fishing in the Republic of Croatia. The revenue generated by granting big-game licenses was calculated by multiplying the number of issued licenses and the amount of fees for their granting. In order to assess the total indirect cost of big-game fishing in the Republic of Croatia, it is assumed that all holders of big-game licenses used the right to perform fishing over the entire allowed period (1 day, 3 days or 7 days), depending on the type of license. Fishing costs were calculated by multiplying the cost of 1 day of fishing with the number of fishing days allowed (1, 3 or 7), depending on the type of license. The cost of 1 big-game fishing day in Croatia was estimated by comparing the direct cost of 1 big-game fishing day in Costa Rica (Ditton and Grimes, 1995).

Production of vessels for sport and recreational fishing

The value of the production of vessels in the Republic of Croatia that are used in marine sport and recreational fishing was estimated with reference to the data on the total number of vessels produced in boatyards and by the total value of nautical production in Croatia. The calculation was supported by the data provided by the Cluster of Boatbuilding Ltd. (Subašić, 2008). In order to gain a deeper insight into the overall impacts of marine sport and recreational fisheries, the indirect economic effects and social impacts should also be taken into consideration. For the purpose of this study, social impacts were assessed by the employment rate and income dependency on fishing in Croatia's Adriatic counties. However, there are some limitations within the performed research, primarily relating to the availability, consistency and timeliness of data required for a comprehensive analysis. These limitations are partly due to the data availability and data processing, and partly due to the fact that economic activities related to the marine sport and recreational fishery (MSRF) fall into a large number of economy sectors according to the national classification of economic activities, so that it is not possible to define precisely the values that relate solely to MSRF. Therefore, in the part where data were limited, research was based solely on the rough estimates and only

the direct economic and social effects of MSRF were roughly assessed.

RESULTS

Number and value of licenses for marine sport and recreational fishing

The number of various licenses granted within marine recreational fishing category and the generated income based on the data provided by the Ministry of Agriculture, Fisheries and Rural Development for the year 2011 were calculated and presented in Table 1. The largest number of granted licenses for recreational fishing refers to those for one-day fishing (15 577 licenses granted), but the highest income was obtained by granting licenses for 7-day fishing (HRK 1 236 000.00, i.e. EUR 164 800).

Table 1. Number of various licenses in the category of recreational fishing and the achieved income in 2011, based on the data obtained from the Ministry of Agriculture, Fisheries and Rural Development

Category of license	Amount granted	Price per license (EUR) EUR 1= HRK 7.5	Total income (EUR) EUR 1= HRK 7.5
License for (1) day	15 577	8	124 616
License for (3) days	5 293	20	105 860
License for (7) days	4 120	40	164 800
License for (30) days	907	93.33	84 653.33
Annual license for persons under 18, for retired persons and persons older than 60	7 981	13.33	106 413.33
Annual license for persons aged 19-59	2 266	66.66	151 066.66
Annual license for persons above 65 residing on the islands and Pelješac Peninsula	876	0	0
Licenses for big-game fishing – tunas and swordfish for (1) day	836	16	13 376
Licenses for big-game fishing – tunas and swordfish for (3) days	390	40	15 600
Licenses for big-game fishing – tunas and swordfish for (7) days	233	80	18 640
Annual license for fishing with seabed longline	1 364	40	54 560
Total	**39 843**		**839 585.33**

Likewise, the data obtained from the Croatian Marine Fishing Association were used to calculate the number and income from licenses granted in the marine sport fishing category. The largest values were achieved by granting licenses in the category of annual license for marine sport fishing of seniors, amounting to 13 659 and yielding HRK 4 780 650.00, i.e. EUR 637 420 in 2011. At the second highest rank is the annual license for marine sport fishing for veterans (8 512 pieces). Although the number of these licenses was 37% lower, the total income in this category was nine times lower (HRK 510 720, i.e. EUR 68 096), due to the minimal individual cost of these documents. As for the short-time licenses, daily license for marine sport fishing for 1 day (6 761 pieces) was the most frequently issued license. However, the highest income was obtained from granting the license for marine sport fishing for 7 days (HRK 86 400 00, i.e. EUR 11 520 for 2 880 licenses) and the license for marine sport fishing for 30 days (HRK 716 100.00, i.e. EUR 95 480 for 1 023 licenses).

Table 2. Income from granted licenses and the number of fishers in sport and recreational fishing in 2011

Type of the licences	Income (EUR) EUR 1 = HRK 7.5	Number of fishers
Licences for sport fishing		
Annual	970 680	26 015
Daily/Multiday	356 758.66	13 801
Total for sport fishing	**1 327 438.66**	**39 816**
Licences for recreational fishing		
Annual	312 040	12 487
Daily/Multiday	479 929.33	25 897
Total for regular recreational fishing	**791 969.33**	**38 384**
Recreational big-game fishing	47 616	1 459
Total for recreational fishing	**839 585.6**	**39 843**
Total sport and recreational fishing	**2 167 024**	**78 295**

According to the available data for 2011, the number of granted licenses for MSRF and the calculated income of the sale of licenses and marine sport fishing membership cards that each sport fisher needs to have, it is possible to conclude that the largest number of licenses granted were the ones in the category of annual licenses for marine sport fishing (26 015 pieces) and in the category daily and multiple day

licenses for marine recreational fishing (25 897 pieces). The highest income was achieved by granting annual licenses for marine sport fishing and membership cards (HRK 7 280 100, i.e. EUR 970 680) and daily and multiple day licenses for marine recreational fishing (HRK 3 599 470, i.e. EUR 1 013 262.66) (Table 2). The total number of licenses issued for MSRF activities amounted to 78 295 and the total revenue from granting MSRF was HRK 16 252 680, i.e. EUR 2 167 024. It should be noticed that the value of big-game fishing in the Republic of Croatia has not been recognized by the state authorities; on contrary, recreational big-game fishing in 2012 was prohibited resulting in the decrease of 23.9% in the number of granted licenses compared to 2011. In all other categories the growth of issued permits has been constantly recorded (Soldo, 2013).

Trade of fishing gear and tools for marine sport and recreational fishing in Croatia

The average value of trade in fishing gear and equipment for MSRF in Croatia was calculated by using the data obtained from two average companies located in the continental and coastal areas of Croatia. The data obtained from the company located in Croatia's mainland show an average turnover of approximately HRK 2.1 million, i.e. EUR 280 000 in 2012. The retail trade turnover, including the value added tax (VAT) on fishing gear and tools trade, was estimated at approximately HRK 3 675 million, i.e. EUR 490 million, while the VAT was estimated at HRK 735 000, i.e. EUR 98 000 per company.

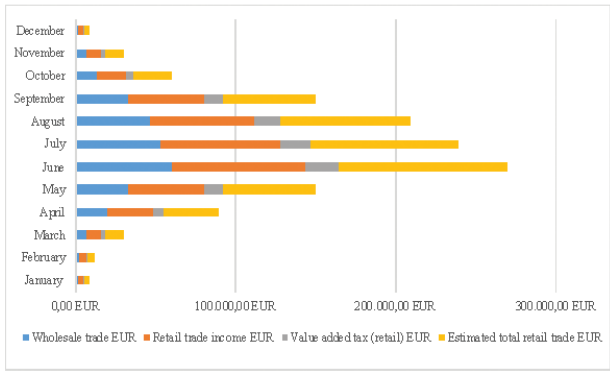

Fig 1. Monthly income of the company engaged in the wholesale of fishing gear and equipment in the continental part of Croatia during 2012 and the estimated trade and retail trade turnover (in EUR)

The company engaged in the wholesale of sport and recreational fishing equipment in the coastal part of the Republic of Croatia experienced a significantly higher average turnover of approximately HRK 2.9 million, i.e. EUR 386 666 in 2012 (Fig. 1). The retail trade turnover, including VAT on fishing gear and tools trade, was also higher and estimated at approximately HRK 5 127 500, i.e. EUR 683 666.66, with the value added tax estimated at around HRK 1 million, i.e. EUR 133 333.33.

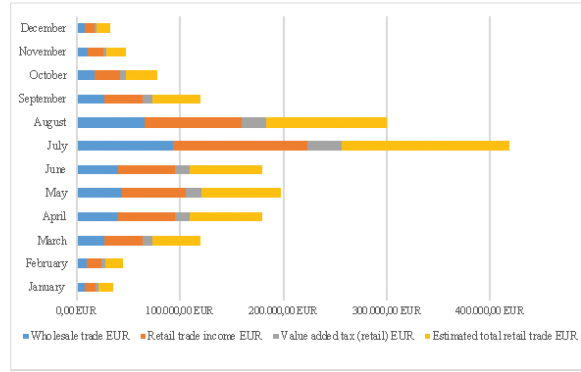

Fig 2. The monthly income of the company engaged in the wholesale of fishing gear and equipment in the coastal part of Croatia during 2012 and the estimated trade and retail trade turnover (in EUR)

According to the available sources, approximately 15 companies are active in selling sport and recreational fishing gear and equipment. It can be roughly estimated that the total market value of the gear and equipment amounted to HRK 66 018 750, i.e. EUR 8 802 500 in 2012. Furthermore, it is estimated that the total income of the retail companies engaged in sport and recreational fishing and fishing equipment amounted to HRK 52 815 000, i.e. EUR 7 042 000, while VAT, as a direct benefit to the state budget, amounted to HRK 13 203 750, i.e. EUR 1 760 500 in 2012 (Fig. 2). Value added tax related to indirect benefits from the sale of fishing gear and sport and recreational fishing equipment through profit tax realized by fishing gear and equipment traders, as an additional part of the budget revenue, has not been taken into account when making this assessment. Also, it should be pointed out that certain errors may have occurred in this calculation, as it was not possible to collect complete precise data from all relevant stakeholders. Therefore, the estimated values of economic indicators calculated in this paper are, de facto, the minimum possible values.

Value of big-game fishing

For the purpose of estimating the direct economic value of big-game fishing in Croatia, the information on the number of special licenses granted for fishing tunas and swordfish in the 2011 and the values of big-game fishing in Costa Rica during the 1993/94 season were used. Ditton and Grimes (1995) found that the total direct cost of individual foreign fisherman in Costa Rica during the 1993/94 season

amounted to around USD 3 446 (the average duration of the trip was 7 days, including 4 days of fishing). The costs included the chartering of a vessel. This information suggests that the direct cost for 1 day of fishing of the swordfish and related fish in Costa Rica was approximately USD 861. Due to the difference in the price of chartering a boat for big-game fishing in Croatia and in Costa Rica, this estimate implies that the direct cost for 1 day of big-game fishing in Croatia amounts to approximately USD 1 000. According to the middle exchange rate of the Croatian National Bank for March 2013 (Anonymous, 2013c), USD 1 000 equals approximately HRK 5 700.00, i.e. EUR 760. Rudd et al. (2002) found that in Florida fishermen paid several-day trips an average USD 246 per day for renting a boat and USD 96 per day for trip and accommodation. Surveys performed by Croatian fishing tourism companies reveal that the price for 1 day of big-game fishing, including boat rental and associated expenses ranges from a minimum of EUR 550 to several thousand, depending on the size of the boat, equipment and type of service on board. In order to show the total costs of big-game fishing in the Republic of Croatia, it is assumed that all holders of tuna and swordfish fishing licenses used the right to fish over the entire period (1 day, 3 days and 7 days), depending on the type of license granted. Based on calculation presented in Tables 3 and 4, the economic value of big-game fishing in the Republic of Croatia is the sum of revenues generated from granting fishing licenses for tunas and swordfish (HRK 357 120, i.e. EUR 47 616) and the total cost of big-game fishing (HRK 20 730 900, i.e. EUR 2 764 120). In addition, four big-game fishing competitions are organized annually in Croatia (Komiža, Vodice, Omišalj, Jezera), and special fees must be paid for participation in these competitions. It can be argued that additional revenues (i.e. expenses of big-game fishermen) on this basis amount to about HRK 500 000 per year.

Table 3. Costs of big-game fishing by type of fishing license and the total cost of big-game fishing in Croatia in 2011

Type of license	Estimated average cost of fishing (EUR) EUR 1= HRK 7.5	Number of granted licenses	Total costs by type of fishing license (EUR) ERU 1= HRK 7.5
License for fishing tunas and swordfish for (1) day	760	836	635 360
License for fishing tunas and swordfish for (3) days	2 280	390	889 200
License for fishing tunas and swordfish for (7) days	5 320	233	1 239 560
Total		**1 459**	**2 764 120**

Table 4. Number of licenses issued to fish for tuna and swordfish, and income from their granting in 2011 according to the data form the Ministry of Agriculture, Fishery and Rural Development

Type of license	Number of granted licenses	Price (EUR) EUR 1= HRK 7.5	Income (EUR) EUR 1= HRK 7.5
License for fishing tunas and swordfish for (1) day	836	16	13 376
License for fishing tunas and swordfish for (3) days	390	40	15 600
License for fishing tunas and swordfish for (7) days	233	80	18 640
Total	**1 459**	**-**	**47 616**

When taking all these aspects into consideration, the minimum economic value of big-game fishing in Croatia of HRK 21 588 020, i.e. EUR 2 878 402.66 was estimated. This value represents the minimum economic value because the estimate has not included the costs of accommodation of fishers in the area of fishing, travel costs and costs of various services during the fishing season, such as catering, shopping, fishing gear servicing, etc.

Value of production of vessels for sport and recreational fishing

It has been estimated that in 2007 Croatia's total domestic nautical production was worth about HRK 1 billion (Subašić, 2008). Based on the number of vessels produced by boatbuilding industry, where over 99% of production refers to the vessels used for marine sport and recreational fishing, the overall economic value has been estimated to HRK 600 million, i.e. EUR 80 million, including the value of vessels and the value of their repair and maintenance. However, due to the lack of complete data on the economic value of the production of vessels for a particular category of boatyards, it is not possible to make a precise estimate of the economic

value of the production of vessels for marine sport and recreational fishing. Moreover, during the period 2007-2013, a considerable decrease in industrial production in Croatia was observed, while on the other hand various additional charges were introduced for the sale and trade of vessels. Therefore, the rough estimated value of HRK 600 000 000, i.e. EUR 80 000 000 of direct economic effects reported in the year 2007 will be used to represent the minimal value.

Total estimated economic value of sport and recreational fishing in Croatia

The total value of marine sport and recreational fisheries in Croatia, presented in this paper through estimated direct economic effects, represents the minimum economic value (lower limit) of marine sport and recreational fishing. It is determined by the sum of the economic values obtained from the estimation of revenues generated by granting licenses for sport and recreational fishing on the sea, total market value of fishing gear and tools, total costs of big-game fishing and the value of production of vessels for sport and recreational fishing (Table 5).

Table 5. Total estimated economic value of sport and recreational fishing in Croatia for 2011

Variable	**Value EUR EUR 1= HRK 7.5**
Revenue generated by granting licenses for sport and recreational fishing	2 167 024
Average value of trade in fishing gear and tools for sport and recreational fishing	8 802 500
Total estimated costs of big-game fishing	2 830 786.66
Value of production of vessels for sport and recreational fishing	80 000 000
Total direct economic effects estimated value	**93 800 310.66**

DISCUSSION

Across the European Union there are various methods used for evaluating the values referring to marine sport and recreational fisheries. The quantification of non-use values associated with recreational fish stocks has been used in Sweden, while in England and Wales the estimation of the marginal consumer surplus associated with recreational sea angling has been applied. In Denmark the impact of recreational fishing expenditures on the national economy has been taken into account, and in Greece the socio-economic importance of recreational fishing from a boat was used as a method. These different approaches make it impossible to establish an economic valorisation of marine recreational fisheries at the EU level (Pawson et al., 2007). As a result, assessing the value of sport and recreational fishing is a complex issue and it is necessary to separate the value generated by various market activities related to sport and recreational fishing (license fees, boat rental and management, fishing gear sale, travel expenses, magazines, etc.) from the values that sport and recreational fishers perceive. Often their value is defined by the amount that a person is willing to pay for this activity (Rudd et al., 2002; Duffield et al., 2002).

It should be pointed out that the gross expenditure does not represent economic benefits, unlike net expenditures which calculate substitution and displacement effects that can be used in conjunction with the regional/national economic models of the economy to determine the economic impact of these expenditures on the region's output or employment (Pawson et al., 2007). Although there is a wide range of expenditure, they can be divided into main categories: variable expenses (e.g. *variable costs of fishing trips, non-permanent fishing items, transport costs to fishing site, food, drink and accommodation associated with fishing trip and competition fees*) and fixed expenses (*boat/trailer purchase, maintenance, moorings, equipment, accessories, permanent fishing equipment, club/association membership fees, licenses, journals, magazines, books, insurance for boat, trailer, equipment*) (Pawson et al., 2007). Following the analysis of licenses for sport and recreational fishing granted in Croatia by category, certain conclusions related to the importance of sport and recreational fishing for the local community and the society as a whole can be drawn. The records show that there was a higher total of licenses granted for sport fishing (51.07%) than for recreational fishing (48.93%). This can be explained by newly introduced restrictions on recreational tuna fishing. Regarding the total number of issued licenses, there is a different share of daily and multi-day licenses and annual licenses. Specifically, out of the total number of licenses granted for recreational fishing, daily and multi-day licenses account for 64.71% while 35.29% fall in the category of annual licenses. In sport fishing category, daily and multi-day licenses participated with 32.53% and annual licenses with 64.47%. Tourists mostly use daily and multi-day licenses, while local fishers prefer annual licenses. Given the fact that more annual licenses are issued in sport fishing, it can be concluded that the local population is more interested in sport than recreational fishing. Duration of fishing varies across the EU, and sources reveal that French fishers spend an average of 9 days (Defra, The Department for Environment, Food and Rural Affairs), Danish fishers spend around 10 days, English fishers spend an average of 11 days (Crabtree et al., 2004), Finnish 18 days and Swedish 33 days per year in marine fishing (Pawson et al., 2007). According to Anagnopoulos et

al. (1998), Greek recreational fishers spend an average of 77 days at sea per year. In the category of sport fishing, only the number of annual licenses granted for longlines has been increasing, while all other types of licenses have recorded falls in sales. When analyzing the categories and the number of respective licenses, veterans and senior holders of annual licenses for sport and especially recreational fishing (with a special emphasis on the islands and peninsula of Pelješac) have increased in less developed areas. According to available data with reference to the age, Portuguese fishers in Mediterranean waters are older than average (50 to 55 years), English fishers are around 46, while in Germany and Baltic countries the average age is even lower, 40 (Pawson et al., 2007). For the accurate estimation of economic benefits, it is always important to calculate the portion of direct and indirect expenditure affecting the observed area (Pawson et al., 2007). Even a rough estimation of direct economic effects results in the calculated economic value of sport-recreational fisheries amounting to HRK 703 502 330, i.e. EUR 93 800 310.66 or 0.2% of Croatia's GDP in 2012, expressed in market prices (according to the Central Bureau of Statistics, 2013). Based on these data, it can be estimated that revenues for the state budget based on sport and recreational fishing amounted to over HRK 27 million, i.e. EUR 3 600 000 in 2012.

The total annual market value of sport and recreational fishing amounts to millions of dollars in some countries. According to the available sources, it is estimated that in Germany it amounts to one billion U.S. dollars (Steffens and Winkel, 2002), 3.4 billion U.S. dollars in the inland waters of England and Wales (Lyons et al. 2002), 281 million U.S. dollars in Sweden, 60 million U.S. dollars in Denmark, 250 million U.S. dollars in South Africa (Griffiths and Lamberth, 2002). Although this calculation represent only the lower economic value, it can be estimated that some 10 000 people in Croatia's coastal area (about 25% of the total annual licenses issued for sport and recreational fishing in 2011) existentially rely on sport and recreational fishing, in terms of additional food source. These figures are even higher when the calculation includes the business owners and employees in the companies engaged in fishing equipment and equipment trade and in production, servicing and maintenance of vessels. Then it is reasonable to estimate that the livelihood of at least 13 000 people is essentially related to sport and recreational fisheries. In some elements, sport and recreational fishing as a type of activity has become an economic and profit making activity as well as an important factor for the development of local and rural economy and a factor that fosters the development and improvement of social benefits in urban areas (Lyons et al., 2002). In 1997 the Ireland Institute of Technology made a first economic analysis of impacts of gross recreational sea angler expenditures. It was estimated that visiting sea anglers spent around IEP 15 million, while the local sea anglers spent much less, i.e. only IEP 9 million in the year 1995. This gross expenditure supports around 850 full time jobs and generates about IEP 6 million in tax revenue to the government (Pawson et al., 2007). According to Smit de Vos and de Wilde (2004), the estimated gross expenditure of EUR 127 million in the Netherlands creates around 800 full time jobs that are directly or indirectly related to the marine recreational fisheries sector. In Germany, Hilge (1998) estimated that the total amount of 900 million euros is the lower limit of profits from sport and recreational fishing. According to this author, it can be assumed that there are more than 20 000 employees directly associated with this activity. These values, although resulting from rough estimates, i.e. without a part of direct and total indirect benefits of sport and recreational fishing taken into account, indicate the importance of sport and recreational fishery. According to Croatia's National Strategic Plan for Fishing Development (Ministry of Agriculture, Fisheries and Rural Development, 2012), the number of fishers employed directly in fisheries amounts to 14 000 and the estimated share of fisheries in the gross domestic product varies from 0.2% to 0.7%. It should be emphasized that, according to national classification of activities, fishing includes marine and freshwater fishing, aquaculture and fish processing. Expressed by the number of stakeholders involved and the share in the gross domestic product (which, on the basis of the estimates carried out in this survey, reaches up to 0.4%), the value of fishing is only slightly lower than that of commercial fisheries. This is supported by the fact that the economic benefits of sport and recreational fishing can be compared with the benefits form commercial fishing (Pawson et al., 2007).

In order to define impacts on the economy and the overall economic effects, the analysis should be extended to the indirect economic effects of sport-recreational fisheries. In other words, it is necessary to examine the extent to which many additional domestic economic operators are involved in supply chains in the trade and production of fishing gear and equipment, the features of the products sold, etc. Furthermore, the analysis should also include information on all other costs of sport and recreational fishing population (e.g. transportation, accommodation, meals, repair and maintenance of boats and equipment, manuals and other literature, etc.). Normally, a thorough research would include not only the fishers as direct participants in the activities, but also their family members or companions, and their preferences and consumption as an additional element of the total value of a particular activity. Unfortunately, such information is not available in Croatia and it is not possible to assess these values without the investigation at the national level which, due to financial limitations of this research, the authors were not able to include in this study.

CONCLUSION

On the basis of the conducted research, it is possible to describe the social and economic significance of the marine sport and recreational fishing in Croatia. With regards to employment, the research has shown that the production and trade of vessels, fishing gear and equipment for sport and recreational fishing provides jobs for at least 3 000 people, mostly in the coastal area of Croatia. As for the estimated lower limit of the economic value of sport and recreational fishing in Croatia, the regulation of these categories of fishing should be in accordance with the stated value, which is not the case at the moment. The importance of sport and recreational fishery, especially in Croatia's less developed coastal areas, will continue to grow and, according to the authors' rough estimation, an increase of at least 7 000 participants in sport and especially recreational fishing can be expected in the near future. Finally, it should be emphasized that this research was performed in order to estimate the minimum economic effects and the overall economic and social significance of sport and recreational fishing in Croatia, with the main goal to emphasize its economic benefits. Indeed, this form of fishery has become a significant profit-making activity as well as an important factor for the overall growth of local and rural economy and a factor that fosters the development and improvement of social benefits in urban areas and local communities in particular.

SAŽETAK

EKONOMSKI I DRUŠTVENI UČINAK SPORTSKOG I REKREACIJSKOG RIBOLOVA U HRVATSKOJ

Sportski i rekreacijski morski ribolov može svojim gospodarskim i društvenim učincima značajno pridonijeti nacionalnom dohotku. Glavni cilj ovog istraživanja je definiranje ekonomskog i društvenog značaja sportskog i rekreacijskog ribolova u Hrvatskoj. Definiranje je napravljeno procjenom donje granice ekonomske vrijednosti sportskog i rekreacijskog ribolova. Donja granica ekonomske vrijednosti računa se analizom segmenata sportskog i rekreacijskog ribolova zajedno s gospodarskim i drugim aktivnostima usko povezanim s njima. Izraženo brojem dionika uključenih u sportski i rekreacijski ribolov, te udjelom u bruto domaćem proizvodu, može se zaključiti da ovaj ribolov ima tek neznatno nižu vrijednost od ribarstva kao gospodarske aktivnosti. Na temelju ovog istraživanja moguće je istaknuti osnovne smjernice društvenog značaja sportskog i rekreacijskog morskog ribarstva u Hrvatskoj. Također, može se primijetiti da sportski i rekreacijski ribolov u lokalnim obalnim zajednicama podupire sveukupni razvoj ruralnih područja i posebno lokalnih zajednica.

Ključne riječi: morsko ribarstvo, Jadransko more, dozvole, mala brodogradnja, *big-game* ribolov

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