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CASE STUDY OF RECREATIONAL FISHING IN RAJOVA (RAJOVIC) RIVER (MONTENEGRO) PRELIMINARY RESEARCH: PART 2

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ABSTRACT

Recreational fishing is a popular activity around the globe, and fish welfare issues related to the activity have received increasing attention in some countries, particularly in central and eastern Europe. This work offers an introduction to recreational fishing, reviews the literature on fish welfare in relation to recreational fishing and provides an overview of potential biological impacts and ways to reduce such impacts. We first focus on the question of how to reduce impacts on the welfare of fish during recreational fishing. Second, we describe a case study on the Rajova (Rajović) River (Montenegro), highlighting that practical implications of the fish welfare discourse may be disjointed from the scientific information base and be about fundamental moral questions about the ethical acceptability of the activity per se. We end by providing an outlook on the future of recreational fishing in light of the current fish welfare discourse.

Keywords: Rajova (Rajovic) River, recreational fishing, brown trout, development.

INTRODUCTION

Fishing is an ancient practice in the acquisition of natural resources dating back to the Middle Stone Age. The principal reasons why humans visit waters to catch fish underwent a substantial transition in many countries throughout the preceding decades. While fishing to gain food is still an important factor in tropical areas of the world, especially in Africa and Asia, it is mostly for sport in inland waters of economically higher developed

countries, as in major parts of Europe and North America (see Welcomme, 2016; Unfer and Pinter, 2018), which is also the case on the rivers of Montenegro. There, the majority of fishermen currently fish solely to obtain recreation or to experience the aesthetics of nature. The valuation of recreational fishing is a key component in the science of river restoration (see Melstrom et al., 2014). By including species-specific biomass, the site choice model can be used to value detailed and diverse changes in fishing quality, e.g., abundance increases for some species but decreases for others, as might be expected under a climate change scenario, under management changes that alter hydrology, or as a consequence of ecosystem restoration (Meyer et al., 1999; Bond and Lake, 2003; Palmer and Bernhardt, 2006). Communicating the role that restored ecosystem services have on individual and social benefits can have a significant impact on ecosystem management decisions, especially when there is conflict over which services a river system or watershed should support (Wohl et al., 2005). In this text, we present a preliminary study of recreational fishing in the case of the Rajova (Rajović) River (Montenegro).

ANALYSIS

For centuries, many eminent and ordinary people thought the resources of the river were without limit. Ommer and Paterson (2014), citing Jentoft and Chuenpagdee (2009) and Khan and Neis (2010), indicate that by the 1980s, we knew that this was not the case but still thought that problems with overfishing were, for the most part, a recent phenomenon that was relatively easily fixed. However, very few people were willing or able to grasp the idea that the boundless River might actually be bounded. In this new century, however, humanity at large is being forced to pay attention to the environment. In some countries, fisheries and their linkages were seen as engines for growth; however, in others, the linkage development stages were ignored, and fish came to be seen as an inadequate or "failed" staple. This broader focus means that where traditionally fisheries scientists' main concern was to apply population assessment models to determine, albeit unsuccessfully, how many fish could be caught and to find ways to limit access to the fishery resource to a manageable few, fisheries management problems have become a good deal more complex.

Appelblad (2001), according to Wendt (1997), points to the development of the typologies of specialist fishing and family fishing by identifying the different elements that constitute the ideal fishing types.

Table 1: Typology of recreational fishermen. Source: Appelblad (2001).

Family fisher	Fishing Expert
"Bite"	Quality
- Easy	- Difficult
- Nice	- Variation
- Friendly	- Unique and special
-Social companionship	- Social companionship
-High service demands	- Updated on new fishing gears

The above-indicated typologies are naturally ideal types. The character of the single angler is undoubtedly more complex in real life. However, the typology is an expression of the great range that exists within the heterogeneous group of anglers. The included elements seem almost contradictory, and only social companionship is the same for both types. However, social companionship is on the whole something different for the family fisher and the fishing expert. For the former, it probably means the family, while for the latter, it is friends sharing the same fishing interests. The different categories of fishermen have different needs, behave differently and must be treated differently from a management point of view. The specialists are a vital group since they influence other fishermen and are often innovators concerning fishing and fishing sites (Appelblad, 2001).

Our research records based on similar studies Smederevac (2007) indicates that Montenegro by way of exploitation of fishery resources between the countries of Western Europe, where recreational fishing is developed to a great extent, and the East, where he has represented commercial fishing as a significant socioeconomic factor in society. Due to the general state of society in Montenegro, which is characterized by unemployment, poor living standards, socioeconomic dispute changes, the regression of large state-owned enterprises and privatization, many residents of Montenegro are further engaged in fishing to supplement their diet and/or as a source of additional income. However, unlike developed countries, where fishing is linked to the quality standard of living, the development of tourism and areas in Montenegro increase the number of recreational fishermen and are not closely linked to areas of progress and living standards. Specifically, is a small number of fishermen belonging to wealthy households? In addition, areas in which recreational fishing is present are not considered as promising as the Rajova River and cannot see the progress of the local community in terms of fishing tourism. Smederevac (2007) further notes that the international experience concluded that it is necessary to create a new legal framework, legislation, or a mechanism that would help to organize activities and resolve the conflict between different users and between users and " administrative " during the period transition in political and economic terms. This conclusion is applicable to Montenegro.

Fig. 1 shows the most important factors affecting the state of recreational fishing according to Smederevac (2007).

To create a unique and appealing brand for recreational fishing Rajova River, Blichfeldt and Nicolaisen (2012), citing research Pike (2004) and Therkelsen (2007), argue that it is essential to define the brand identity (sometimes referred to as personality) of the destination, meaning identifying the core values and attributes that best represent the destination. Blichfeldt and Nicolaisen (2012) further indicate that in research Morgan et al. (2002), Konecnik and Go (2008), Aaker and Joachimsthaler, 2000), brand identity helps establish a relationship between the brand and the customer. “The arguments put forward by these authors appear to be based on Kapferer’s (1998) premise that “before knowing how we are perceived, we must know who we are”, indicating that the destination, rather than the consumer, should define both its brand and content (Konecnik

and Go, 2008). However, when people go on holiday, they not only consume a product from one supplier but also consume a bundle of products and services as a whole (Morgan et al, 2003; Smith, 1994). This means that many different suppliers participate in creating the total tourism experience, e.g., accommodation and catering establishments, tourist attractions, entertainment and cultural venues as well as the natural environment (Blichfeldt, 2005; Buhalis, 1999; Morgan et al., 2003). Consequently, horizontal cooperation is needed, meaning that a range of agencies and public/private companies need to cooperate in the task of defining the brand identity (Morgan et al, 2003)" (Blichfeldt and Nicolaisen, 2012). Ambitious claims are made about the benefits of destination branding (Henderson, 2007); in the distant future, it is necessary to introduce the destination branding Rajova River. How beautifully concludes Blichfeldt and Nicolaisen (2012), branding for recreational fishing Rajova River "in context therefore requires coordination and control of the destination's marketing mix and cooperation among all stakeholders". The authors therefore encourage researchers to further investigate this topic, bearing in mind that perhaps the complex nature of destinations may call for an entirely different approach to branding".

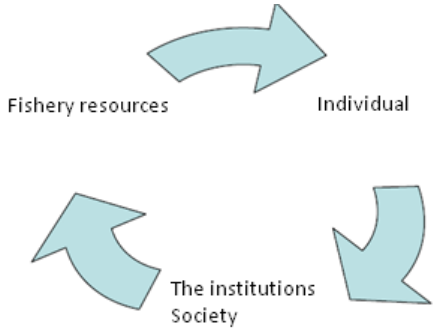

Figure 1: The most important factors affecting state in recreational fishing (Smederevac, 2007).

In regard to fishing the Rajova River, prospects of development are primarily made possible through the improvement of water management, the establishment of regular monitoring of resources of brown trout conservation of the habitat of the brown trout Rajova River, Trešnjevička River and Čukačka River, adjustment of fishing pressure with the capacity of fishing waters in accordance with the sustainable use of fishing waters, the introduction of mandatory adequate records of catches in sportrecreational and commercial fishing, making it impossible to monitor trends, the introduction of stricter measures of control of hunting and poaching punishment, and the popularization of sport-recreational fishing in the context of sustainable use (Bulatović et al., 2019; Bulatović et al., 2019; Bulatović and Rajović, 2020; Bulatović and Rajović, 2020; Bulatović and Rajović, 2021a; Bulatović and Rajović, 2021b; Bulatović and Rajović, 2021c; Bulatović and Rajović, 2021d; Bulatović and Rajović, 2022).

Characteristics of the geo-space Rajova River in functional recreational fishing

The Rajova River provides ideal living conditions for brown trout. For centuries, many eminent and ordinary people thought the resources of the river were without limit. Very few people were willing or able to grasp the idea that the boundless River might actually be bounded. In this new century, however, the population at large is being forced to pay attention to the environment (Ommer and Paterson, 2014). Generally, with increasing industrialization, the importance of commercial fishing decreases, and inland water bodies are increasingly or exclusively used by recreational fisheries (Fig. 2).

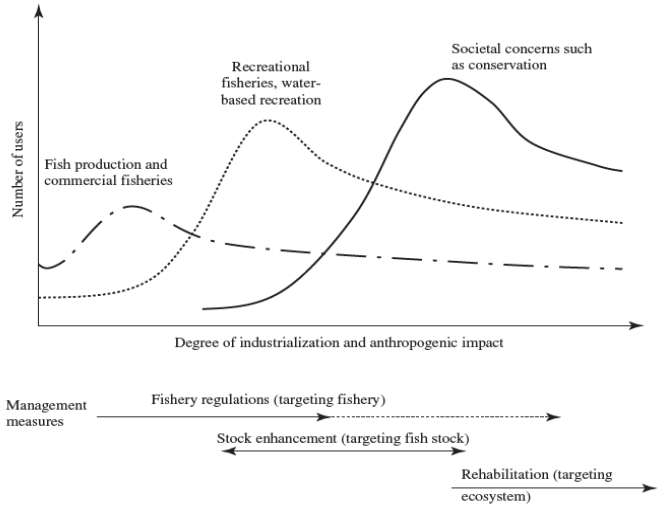

Figure 2: Schematic of the life cycle of inland fisheries. The text inside the figure indicates the predominant use or concern of inland water bodies (Cowx and Arlinghaus, 2008).

Anyway for recreational anglers in what direction a chance to move - to the foot of Lise, where is source Rajova River, or downstream to Dubokalj, will encounter impressive scenes, which could be sufficient for a television series eco-reports. Color body brown trout in Rajova River is correlated with residence and with certain variations, color the back it is dark brownish-black, and by her hips brighter in various shades of yellow to golden, while the belly pearly white. The body is covered with black and bright red freckles framed by bright rings. Trout living in the project area Rajova River and Trešnjevička River are brighter colors, while brown trout, which live in Čukačka River with rocky shelters, are darker color. Brown trout in the study area feed on insect larvae, insects, and shrimp or devour their own offspring. Depending on the weight and age of the female, the number of eggs moving meters 700-3.000 eggs, which are red - orange in size from 3.5 - 5 mm. The incubation period of fertilized roe at the optimal temperature of + 5 °C takes 50 - 80 days. Brook trout in the Rajova River spawn on suitable sandy - gravelly or rocky bottoms with a strong stream of water. Females lay eggs at a water depth

of approximately 0.5 m. After completion of spawning, brown trout migrate downstream mainly in Kraštica to Lima. Given that the feed and fish eggs themselves brown trout, found that at the end of the first year of life remains only 25% of the number of fertilized of roe. The growth of brown trout in Rajova River is directly related to the living conditions of habitat (physical and chemical quality of water, the amount of food...).

Recreational fishing in the Rajova River can be roughly divided into handheld fishing (only hands under the stone) and fly fishing. Capture of brown trout hands under the stone requires knowledge and patience from recreational anglers because the fish mentioned above are very cautious and craven. Irrespective of the different interpretations, we believe that this type of recreational fishing is considered a sport fishing because the angler must outwit a fish, only his hands under the stone. Rajova River they appear rapids and whirlpools, which fly fishermen the opportunity to express their imagination, knowledge and creativity in the hunt. Brown trout can be hunted during the day, the upstream movement of fishermen at the shallows Rajova River, where all the probable places searched for upstream and downstream oblique pulling. The withdrawal is carried slightly at a higher speed than the speed of the watercourse to impostor had the proper operation and to be able to guide you in the right direction. Most often, in the Rajova River, brown trout are caught in length from 15 to 20 cm, although specimens of 25 cm are not rare. Many were lucky enough to be photographed with examples from 30 to 35 cm, a rare and only with larger. On the Rajova River, brown trout are fished for pleasure and for socializing (Fig. 3). Recreational fishing in the project area is allowed from the beginning of March, but successful recreational fishing is possible only after passing large water and floods, and the rivers clear and return to their course. Depending on the hydrometeorological conditions and altitude, melting snow will follow sooner or later. Keeping all this in mind, the brown trout in the Rajova River can be successfully hunted a cheat beginning in mid-April. Due to the additional cold water, life in the Rajova River, Trešnjevička and Čukačka River is not yet at full intensity, and greater activity should be expected in the warmest part of the day.

Figure 3: Brook trout are very demanding in terms of water quality and temperature. This fish does not tolerate oxygen concentrations lower than 7-12 ml per liter of water, as well as temperatures above 5-10 degrees.

Our research records based on similar studies Radojević (1997) indicates that the starving and exhausted spawning brown trout, the slightly stronger flow of spring water and lack of food in it, not particularly movable and held quieter parts of the Trešnjevička River on locality "Under Lomova" and Rajova River (deep whirlpools), especially on the stretch of alluvial plains Novović to watermill Labović and alluvial plains Milićević to Bridge on the Rajova River. Their position in the water is caused by the rational energy balance, which is the instinctive action characteristic of all species of fish, but it is most pronounced in salmonids because of the conditions in which they live. In early spring, brown trout in Rajova River should not be sought in strong and fast water, but in to a quiet and slower, around the major obstacles and trees near where the mainstream of carrot and shadow expects her water applied to food. Such behavior of are brook trout to be adapted and the nature of fishing. With the beginning of the year and the increase in water temperature, the brown trout in Rajova River become more mobile and more aggressive; take up positions on the shallower areas and a faster flow of water. Smaller specimens of brown trout then love all day in the rapids above the falls and the rapids, while large and still residing in the deeper areas and go out to hunt at dawn or at dusk or in cloudy weather, the higher the rapids or toppings around larger obstacles, rocks or fallen trees. The rule is that the largest brown trout occupy the best seats in Rajova River and them accordingly and should be sought. In late summer and early autumn, when the water temperature starts to fall, brook trout are the most intense food. Frequent autumnal cloudiness and short rains in the rural village Gnjili Potok created ideal conditions for hunting larger brook trout, which are coming out of the shelter only when compelled by hunger in the course of the year (Fig. 4).

Figure 4: Rajova (Rajović) River - is an ideal landscape for excursions, hunting, fishing and hiking.

Arlinghaus and Cooke (2009), citing research (Franklin, 1998; Muth and Bowe, 1998; Fedler and Ditton, 2001; Cox et al., 2002; Sullivan, 2002; Arlinghaus and Mehner, 2004; Carpenter and Brock, 2004; Arlinghaus, 2006; Arlinghaus, 2005; Arlinghaus et al., 2007),

indicate that below, we present an abbreviated list of the most important management challenges faced by contemporary recreational fi sheries stakeholders. Declining participation: A common problem for recreational fi shing in some countries is declining license sales (and presumably the participation rate). These declines are the result of demographic change and an increasing urban population in which rural lifestyles and activities such as hunting and fi shing are becoming less popular. Considering that many of the proponents of angling and hunting are now from urban rather than rural environments, there is interest in enhancing opportunities for urban fi shing in an attempt to reverse the decline. Stakeholder confl icts: Fishing requires space and interacts with wild living organisms. At times, anglers and others engaged in recreation occupy the same space, generating confl ict intrasectorally. However, one of the greatest sources of confl ict in the future is likely to be fi sh welfare and the more fundamental and ideologically driven animal rights movement. For these stakeholders, hunting a wild animal for the sake of recreation is typically perceived as a cruel activity that should stop. This perspective aligns with the value and belief system of many recreational anglers. Controlling effort and harvest: There is some potential for self-regulation through dynamic fi sh - angler interactions. That is, some anglers will leave a fi shery when fi sh abundance declines and resume fishing if fish populations rebound. There are instances where harvest controls alone have been ineffective in sustaining recreational fi shing, resulting in calls to limit entry (and thus directly control effort). To control angling effort and harvest, the use of license allocation lotteries and the implementation of aquatic protected areas have recently been proposed. In the latter case, all fi shing activities are typically prohibited, thus effectively reducing effort (and harvest) to zero. We predict a greater use of both harvest regulations and effort control means in the management of fi sh and wildlife and that a combination of these tactics will be locally effective depending on the environmental conditions and the biology of the species targeted. Compliance: Fundamental to the function of management regulations for fish and wildlife is the need for high levels of compliance. Unfortunately, fishing suffers from less than perfect compliance, at times making management strategies falter or fail. Recent research efforts have focused on identifying a typology of the motivations for poaching that are common to both the hunting and angling sectors.

Gupta et al. (2015), with reference to research Dahanukar et al. (2011) and Raghavan et al. (2012), point out that the majority of the anglers informally interacted with mentioned that they had witnessed destructive fishing techniques at/near their angling locations, e.g., the use of explosives such as dynamite, illegal fishing nets and electricity. They identified factors such as overfishing, the use of illegal fishing techniques to catch fish, water pollution, the lack of administrative support from authorities, the poor availability of freshwater management strategies, and the clearing of riparian habitats. Our research evidence based on similar research by Gupta et al. (2015) indicates that one of the issues facing the recreational fisheries in Montenegro is the lack of representative data for the recreational fishery from which to inform management. This is a challenging issue because of the enormous difficulties in sampling people in a developing country where contact by phone, physical address or online is highly variable by region and state. The

widely adopted standard of a telephone-diary survey may be difficult to implement under these conditions; therefore, alternative sampling methods such as face-to-face interviews or angler diaries may need to be explored. Strategies currently being tested in Australia (i.e., social network sampling without the use of online methods) may be relevant in Montenegro. There are many other potential methods used in health sciences (e.g., simple random sampling, systematic sampling, stratified sampling, or snowball sampling) that could be applied to difficult-to-sample populations. There is also a crucial need to involve agencies (i.e., government, fishing organizations, and communities) responsible for funding such surveys. Such an approach has the potential to assist in obtaining a representative sample of montenegrin recreational fishers.

The main factors endangering the populations of brook trout by the Rajova River are excessive workload fishing, habitat degradation and restocking. The most disturbing factor is the excessive fishing load, which includes not only legal fishing but also poaching. The main reason for the extremely high fishing pressure is sufficient and nonprofessional implementation of fishing controls, as well as the nonapplication of safeguard measures in fisheries. The second important factor is threatening direct habitat degradation in the form of forming a water intake for agricultural purposes. Conservation Strategy Work Group - Eastern Brook Trout Joint Venture (2005) citing the following research: Hoover and Morrill (1939), Brasch et al. (1958), Warner and Fenderson (1960), Scott and Crossman (1973), Raleigh (1982), Wentworth (1987), Belford and Gould (1989), Wong et al. (2000), Gibson et al. (2005) indicate on man-made barriers that obstruct fish passage, can fragment brook trout populations and prevent migration to suitable spawning habitat, to cool water refuges during warm periods during the summer and to overwintering habitat. Land application of pesticides and herbicides can result in residual inputs to adjacent waters, causing considerable impacts on brook trout populations, with the most serious effects occurring for young-of-the-year fish. The removal of gravel and other streambed material also has a number of detrimental effects on brook trout. The optimal substrate for the maintenance of a diverse invertebrate population in streams consists of a mosaic of gravel, cobble, and boulders, with cobble being dominant. Stream reaches dominated by rubble and gravel bottoms support the highest brook trout densities (Laikre and Ryman, 1996). The third most important risk factor is populations of brook trout restocking. This activity has not gone too far, and thus far has only stocked fishing attractive water Lima, suffered a big fishing pressure. Track records of restocking in the territory municipality Andrijevica generally do not exist, but it is known that the material for stocking purchaser throughout the former Yugoslavia, not even taking into account the restocking of materials belonging to at least the same catchment area, let alone the restocking supplies of indigenous origin known genetic structure (Laikre and Ryman, 1996; Marić, 2005). With the right, the Conservation Strategy Work Group - Eastern Brook Trout Joint Venture (2005), referring to the research of Waters (1983), Larson and Moore (1985), Goede (1986), Stewart (1991), Hindar et al. (1991), Kruger and May (1991), Allendorf et al (2001), Bonney (2001), Dunham et al. (2002), Peterson and Fausch (2003), NCWRC (2003), Dunham et al. (2004), and Molchanova (2014), conclude that the introduction and spread of competing

fish species has a substantial impact on trout populations. Brook trout are extremely vulnerable to the effects of predation and competition from other fishes, particularly in the first years of life. The potential impact of stocking hatchery-reared trout on top of self-sustaining brook trout populations includes genetic alterations due to interbreeding or altered selection pressures, displacement, and introduction of diseases.

Table 2: Key strengths, weaknesses, opportunities and threats with respect to the interrelationships between recreational fisheries and conservation of aquatic diversity (Source Cowx et al. (2010).

Strengths	Weaknesses
High social and economic value of recreational fisheries. Anglers act as guardians of the environment. Expansive network of dedicated persons lobbying or otherwise directly working toward conservation goals. Investment from angling revenues toward conservation programmers.	Potential for lack of understanding of the ecological processes driving fish population dynamics. Potentially naive awareness of the complex issues and problems facing aquatic biodiversity. Occasional misconception that fisheries can only be improved by intensive stocking. Fishes and fisheries often considered of marginal importance because the value of the resource is usually ill defined. Recreational fisheries are often given low priority in any consultation process and tend to operate in an isolated environment. Intrasectoral and intersectoral conflict surrounding aquatic ecosystems make it difficult to came t consensus on issues related to conservation.
Opportunities	**Threats**
Willingness of anglers and general public to support environmental and conservation campaigns through environmental education and extension programmers. Lobbying of potentially damaging ecosystem development projects. Reduce burden on fish stocks by shifting exploitation of fish from intensive commercial to recreational fishing in Inland and coastal waters. Adopt ecosystem approach to fisheries management to encapsulate recreational fisheries and conservation goals.	Main external threats to biodiversity are species stocking, introductions, translocations and invasions, impoundment of running water, water quality deterioration, habitat alteration and fragmentation. Local overexploitation of fish stocks. Recreational angling practices affecting the structure and function of fish populations and potentially entire aquatic ecosystems. Recreational fishing implicated with disturbance to wildlife and the environment. Animal welfare concerns that holding of fishes at high densities, coupled with the hooking, playing and handling of the captured fishes, can cause injury and distress.

In the broadest are sense of the inland fisheries based on the idea of using “common public good". Parts of the river are given to the management of enterprises or communities with the idea that these properties should be managed in the best possible way and that they

should be left to future generations in nonmodified form, i.e., improved and undamaged. Each user of the river should think about the river in a similar way and to understand the importance of the river for the local population and for the wider community. However, many misunderstandings about the use of the river are based on the lack of "in common understanding" or partial understandings, which are often uncoordinated and lead to the depletion of the river of wealth (Smederevac, 2007).

The survey results and their interpretation

Amateur fisherman is lover of this sport, basically looking eyes of economists in fisheries and fishing. Care is primarily interested in how more often to get to the water and to the unforgettable experience. Namely, recreational fishers on Rajova River do not go to water only for fishing but to enjoy nature and its beauty. Equally rejoice and enjoy all weather changes that occur periodically during the year - the awakening spring and appear a flock of birds on the River, spawning fish, and cross-country flight of wild ducks in late autumn over the water fishing. The joy of recreational fishermen is rural village Gnjili Potok, just as there are to the admiration of the beauty of irreversible changes in nature but also to those that are cyclically repeated to give him a sense of security and protection. I fully agree with those who believe that the recreational angler finally determined to be a fisherman because the excitement and joy that fishing brings wishes so often intense that experiences (Čakić, 1996).

In this sense, the mountain town with its favorable climate, as observed space with mountains Trešnjevik and Lisa can certainly be carriers of recreational tourism in the future, "because they offer a lot that requires modern climatology: higher air flow due to the high fragmentation of relief, as i know the rose winds, and ventilation to the collision of air masses, which has a positive effect on the cardiovascular, respiratory and respiratory system; numerous sources of drinking water, which belong to the first group of high-quality water with a temperature that allows custom refreshments but also the experience of space; elevation of the best works on the organism, because the best health resort altitude of 600 m to 1500 m above sea level (Gnjili Potok is situated at an altitude of 1196 m above sea level, Trešnjevik 1573 m above sea level, Lisa 1878 m above sea level) što je pogodno za izletnički masovni turizam, za lečenje disajnih organa which is perfect for excursions mass tourism, for the treatment of respiratory tract (to 1000 m above sea level) and cardiovascular disease, as well as sports and recreational activities (to 1500 m above sea level); large expanses of forest, coniferous how both these deciduous forest as we know it "factory" oxygen" (Gligorijević and Novović, 2014).

Results of the survey

The most important reasons for going to recreational fishing in the river Rajova River and the opinion of the recreational angler are relaxation, recreation, socializing with friends, and escape to nature from the daily duties and stay on oxygen. According to Radivojević (2011), modern medicine has scientifically proven that oxygen slows the aging process

of cells, improves concentration, reduces fatigue, strengthens the immune system, accelerates the period of rehabilitation and wound healing, helps with breathing difficulties, improves mental state, increases athletic activity to 25%, decreases stress, and helps with circulation problems.

When asked to personally usually go fishing, they were offered replied independently, go with friends, or with family members. Recreational anglers are mainly on the river in the period from June to October. Annual fishing spent 20 to 35 days. It spends up to 4 hours in recreational fishing daily, but since it is an active fishing, it includes hooks in the water for approximately 4 to 6 hours. In the following order of importance, we get the answer to the question what is a successful fishing: the first fish quality is desirable, the number of specimens caught of capital, then the quantity of catches and individual size of fish in the catch. Examined recreational anglers usually catch hold of them is legally allowed or paid their catches friends and/or other relatives. Caught fish not sold. According to the answers that are given in terms of investing in this activity, recreational anglers agree that recreational fishing is a sport for everyone, given that the investment will vary depending on your personal budget,

The number of recreational hunters rb Rajova River is mainly seasonal and sporadic; it is a small (6) in the territory where they are fishing. However, there is a general intolerance toward commercial fishermen from other areas, so they want to have the option of fishing in the wider area. They are satisfied with the available data on fishing in the media. On the question of the existing problems in recreational fishing, we offered the following list of answers: the lack of fish, poor regulations, poor control, the use of illegal fishing tools... There are warden hired by the user, or one who has a fishing competition on a given area of forest. He charged the license, then that money is paid guards, stocked with... Custodians are armed; they have no right to detain, bond and apply force. Specifications may ask to inspect only a fishing license but not an ID. Unlike many countries, Montenegro has no ranger service in charge of the whole territory of the country. This organization should have powers similar to those that have the cops, and therefore would not suffer the problems of local warden because they are few and poorly paid, and poaching may prevent accident or if you catch them at work.

In accordance with these problems, recreational fishers propose the following solutions: strengthen controls and prevent illegal fishing, restocking as a measure to protect fish resources, and protect the environment in a global sense. There is awareness of the problem of pollution or that recreational fishers are not paid special attention during the interview.

By analyzing recreational fishing in the Rajova River, we observed some of the general problems of the fishing sector in Montenegro. Specifically, there is a visible trend of decline in recreational fishing, as the one in exclusive recreational purposes, and one that has more than just recreation and economic importance. Recreational anglers in the analyzed area are men, middle age, live with their families, and are engaged in agriculture. Educated are at the level of finishing high school. They are mostly residents of the area along the Rajova River, and there is no need to travel to recreational fishing for more than

2 to 4 km. Have are their own equipment. They are engaged in fishing such as relaxation, recreation, and entertainment. Catches are used in their own nutrition and feeding their families. Recreational anglers prefer to catch river trout and quality to consider success, although a significant amount of fish and the catch. They do not have overly ambitious intentions to invest. According to the position of recreational fishing, the recreational fishing problem is related primarily to poaching, poor control, the use of illegal fishing tools...

In the period after World War II, there was organized management of parts of the river. Specifically, in the former Yugoslavia, there was a self-management model of the socialist market economy, which was the institutional and regulatory comparable to market economies of Western Europe, even in some segments not much below the European level. In the transition period, in which we are currently in, there is disorganization of the whole activity, and it is noticeable fading of these branches of the economy. Fishing is a marginalized economic sector and industry without a significant impact on overall social welfare. Due to the transition to a market economy, the situation began to change in favor of the gray market. There are few private companies in Montenegro who are interested in higher capital investment in fisheries, and the state has no interest in organizing and regulating legal resource management, thus enabling individuals to continue working in the "gray zone", buying social peace. Montenegro is currently at a crossroads between the West, where recreational fishing is developed to a great extent, and the East, where it can be said that it is still present commercial fishing (Smederevac, 2007).

According to Čakić (1996), everything that happens is the result of a series of factors and has several causes. Specifically, the objective causes of the above is the author ranks first - a slow but confident and unstoppable decline in the quality of fishing waters less can meet and sustain larger fish (the author of this text are often remember how, only twenty - five years together with their father Dragoje knew that catch daily from 15 to 25 pieces of brown trout in the Rajova River or between 6-8 pieces in Trešnjevička River. Then, the brown trout were plentiful. It was the golden age causing mass occasionally comes to the pestilence of fish and second- anglers in active age are increasingly burdened professional and work obligations, they must fight for daily survival, existence, which for this type of sport and entertainment, joy, enjoyment and excitement are all less time. Čakić (1996) further notes that in the subjective causes in the first place without competition standing lack of specific qualifications fishermen to fish, therefore lack the necessary education to which fishing is inextricably linked to the persistent conservatism. Natural and artificial selection in water expanses are changes in the conditions of life in wider areas and at certain habitat conditions that customize fish populations. Moreover, what happens to fishermen? Many among them psychologically, emotionally, methods applied in the fishery, in a word, their whole attitude and conservatism hardly reach to the knowledge and practice of at least 15 to 20 years, and some are not yet at that level.

DISCUSSION

Globally, the number of recreational fishers is sizeable and increasing in many countries. Associated with this trend is the potential for negative impacts on fish stocks through exploitation or management measures such as stocking and introduction of nonnative fishes. Nevertheless, recreational fishers can be instrumental in successful fisheries conservation through active involvement in, or initiation of, conservation projects to reduce both direct and external stressors contributing to fishery declines. Understanding fishers' concerns for sustained access to the resource and developing methods for their meaningful participation can have positive impacts on conservation efforts (Granek et al., 2008). We examined case studies that demonstrate successful involvement of recreational fishers in conservation and management activities on the Rajova River. "We devised a conceptual framework for the engagement of recreational fishers that targets particular types of involvement on the basis of degree of stakeholder stewardship, scale of the fishery, and source of impacts. These activities can be enhanced by incorporating local knowledge and traditions, taking advantage of leadership and regional networks, and creating collaborations among various stakeholder groups, scientists, and agencies to maximize the probability of recreational fisher involvement and project success" (Granek et al., 2008).

Traditional regulatory options (formal institutions) imposed by government agencies, such as harvest and gear restrictions, represent the standard in recreational fisheries management, at least in developed countries. However, a number of alternatives exist, including the use of angler education programs that attempt to evoke voluntary changes in angler behavior, resulting in the emergence of voluntarily motivated resource-conserving informal institutions. These 'softer' approaches to aquatic stewardship and fisheries management can be developed in cooperation with stakeholders and in many cases are led by avid anglers and angling groups. Education efforts that provide anglers with knowledge on best practices and empower them to modify their behavior hold great promise to meet formal management goals and objectives but seem to be underutilized relative to formal regulations. Informal institutions that protect resources and help overfished stocks recover hold great promise in both developed and developing countries, particularly when there is a single stakeholder group or when the capacity to enforce traditional regulations or to invest in stock assessments is limited. Informal institutions may help make formal institutions more effective or can even be alternatives to costly institutions that depend on enforcement to be effective (Cooke et al., 2013).

Recreational fishing for people in adult and old age can have a major contribution to the prevention "of diseases on modern civilization". Our civilization has delivered us physical work, but we were so brought of diseases cardiovascular diseases. An increase in the number of so-called welfare of diseases: diabetes, high blood pressure, cancer, respiratory tract as a consequence of smoking, alcoholism, mental illness, as well as many others. That is why the free time and holidays opportunity to the rivers, the organism "recharge their batteries", i.e., renewal of physical and mental strength. Consequently, in almost all

countries, a large percentage of tourists stay in the rivers, among others practicing recreational fishing. In the background of these recreational activities, a combination of natural factors cleans air and water, which positively affects the body and preservation of health (Gligorijević and Novović, 2014).

Our research records in the form of final considerations indicate the following. The first historical sources of the Rajova River were found in approximately 1744. The man through history Rajova River in various ways is fishing. Excess mercury caught fish that he could not take advantage of that moment, kept in various pools, artificial or natural origin, as a reserve for the winter period. Over time, the brown trout on the Rajova River began to multiply so that the man started to gain valuable experience and to establish knowledge that enabled us to become a fisherman from the grower.

The Rajova River along the entire length of the basin receives numerous springs and streams. On the right: Trešnjevička River, Brestov Do, Vranjak, Vrelo, Laz, Žunjački Stream, Jagodnjak, Ravni Lom, Jelar, Stream Ornice and Stream Lanište. On the left: Parlog, Laščić, Radmilički Stream, Bakin Stream, Gnjili Stream and Suvi Stream. Brown trout inhabit the Rajova River, Trešnjevička River and Čukačka River.

Rajova River is deals recreational fishing for six recreational fishermen who catch brown trout engaged manually (only hands under the stone) and fly fishing. The most common catch brown trout in length from 15 to 20 cm, although not rare specimens of 25 cm. In early spring, river trout in the Rajova River should not be sought in strong and fast water but in quiet and slower water. With the beginning of the summer and by increasing the in water temperature, the brown trout are becoming more mobile and aggressive, occupying positions in shallower areas and a faster flow of water.

The main threatening factors in the population of brook trout in the Rajova River are excessive fishing workload, habitat degradation and fish stocking. All that happens is the result of multiple causes. The objective causes, on the one hand, make us unstoppable decline in the quality of fishing waters Rajova River, which is less able to satisfy and maintain the larger fish loads. On the other hand, recreational anglers in an active age are increasingly burdened with professional and work obligations, so they must fight for daily survival and existence, which for this type of sport have less time. The subjective causes classify a lack of necessary fishing education.

The most important reasons for going to recreational fishing on Rajova River the opinion of the recreational a fisherman are relaxation, recreation, socializing with friends, and escape to nature from the daily duties. Examined recreational fishermen's usually catch hold of them is legally allowed or donates their catches friends and/or other relatives. Caught fish not sold. They do not have overly ambitious intentions to invest in fishing gear or to be breeder's brown trout. According to the position of recreational fishermen, the recreational fishing problem is related primarily to poaching, poor control, the use of illegal fishing tools...

The above perspectives suggest, according to Ditton et al. (2002), several questions about recreational fishing. Unfortunately, there are few, if any, answers in the human

dimensions of fisheries literature. In the future, these questions will need to be addressed by research and/or facilitated discussion: 1) What are the major social, geographic, and natural resource predictors of current levels of fishing by nonresidents? Specifically, why do some states attract nonresident anglers? What, if anything, can be done by fishery managers to retain resident anglers and perhaps attract nonresident anglers? 2) Are there cases where increasing the fishing days of nonresident anglers has exacerbated overfishing or its perception by resident anglers? 3) Will those states expecting high levels of population growth in the future be able to serve resident as well as nonresident anglers, or will there need to be restrictions on the number of nonresident licenses? 4) Do economic development concerns always trump resource concerns, or can the number of nonresident anglers and their fishing days be regulated in some way when and if they become a problem? 5) Has fishing by nonresident anglers led to social impacts in communities that negate the economic impacts generated? 6) To what extent are the values of resident and nonresident anglers in conflict on catch and release, the use of live bait, bag limits, and other fishing issues? 7) Do legislatures do more harm than good when they rapidly escalate the costs of nonresident fishing licenses? 8) Do reciprocity agreements between adjacent states that allow anglers from one state to fish in the other with a resident license create benefits for each state? 9) Will there be a time when state fisheries management officials must consider all of the above concerns and determine an optimum number of nonresidents to be allowed to purchase a license restrict nonresident licenses to a particular number of days? 10) Finally, what can be done by agencies and private sector businesses to ensure that the benefits of nonresident fishing exceed the costs for resident anglers and fishery resources?

The Rajova River has favorable conditions for growing brown trout. However, according to Strategy fisheries Development of Montenegro (2006) specific problems of the sector in trout farming are: parent stock is very old (50 years); there is a high possibility of mating closely related individuals resulting in a genetically poor offspring; the introduction of new genetic material is crucial because current methods are hugely inefficient (currently 21 trout pond in Montenegro for breeding use water from rivers, while on Pivskom Lake there is one system of cage production of trout), with a slow increase (requires 18 months compared to an achievable 12); Inadequate feeding regimes usually lead to low levels of production; nuts spawn in November/December, so that the introduction of the production of parent stock that spawn in the spring allow the hatching of eggs in February, which would significantly extend the period over which fingerlings can provide; loss of water supply to some ponds is very strong; a need for novel variants of the parent material, in order to reduce dependence on a single source because the trout sector faces heavy competition from supplies from Bosnia and Herzegovina, but there are indications that a part of the offer from the import of low quality; the use of obsolete equipment on ponds, HACCP the system still does not apply; currently unfavorable credit policies; Use of malachite which is a prohibited substance EU legislation, although there is some possibility of additional sales within the Balkans; export opportunities are limited, unless they improve productivity and thus increase the competitiveness of the Montenegrin offer; market competition in the EU is sharp; average price for trout

produced in Mediterranean countries is 2.62 €/kg, while production costs are in the region of equivalent to 1.47 €/kg, crnogorska pastrmka se na domaćem tržištu prodaje za 3,5 €/kg; special features relating to the technical and production improvements and the use of cheaper but quality food.

CONCLUSION

Recreational fisheries are complex social-ecological systems that play an important role in aquatic environments while generating significant social and economic benefits. The nature of recreational fisheries is diverse and rapidly evolving, including the participants, their priorities and behaviors, and the related ecological impacts and social and economic benefits. Hence, careful management and monitoring of recreational fisheries is essential to sustain these ecologically and socioeconomically important resources. Comanagement actions are rising, often involving diverse interest groups, including government and nongovernment organizations; applying collaborative management practices can help balance social and economic benefits with conservation targets. For example, anglers can play an important role in fisheries monitoring and conservation, including providing data on fish abundance and assemblages. With careful development of research initiatives, monitoring and management, sustainable recreational fisheries can generate positive outcomes for both society and natural ecosystems and help solve allocation conflicts with commercial fisheries and conservation. The case study of Rajova (Rajović) River confirms that.

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