

FISH POPULATIONS IN FISHING WATERS IN THE AREA OF FOJNICA MUNICIPALITY*

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Original scientific paper

Abstract

The ichthyological research in this study aimed to determine the current state of fish populations and to obtain relevant data on the presence of certain fish species in the fishing waters of the Fojnica municipality. The field part of the ichthyological research in the fishing waters of the Fojnica municipality was conducted in October 2019, in the following watercourses: Fojnička River, Željeznica, Radava, Brložnjak, Dragača, Požarna, Borovnica, Hrastinčica, Kozica, Jezernica and Šćona. The fish were caught with a special-purpose electrofishing generator – model "Honda" OHV 5.5 (with a power of 3.0 kW). Collected fish samples were processed on-site, and all individuals were then returned to the watercourse from which they were caught. The ichthyological research in the fishing waters of the Fojnica municipality recorded 9 fish species from four families of freshwater ichthyofauna. Systematic determination revealed that the Salmonidae family is represented by 4 registered species (44.44%), while the Leuciscidae family is represented by 3 species (33.33%). The families Cyprinidae and Cottidae are represented with one registered species each (11.11%). Based on the analysis of the results from field research conducted at representative localities of the aforementioned watercourses, it can be concluded that the ecological conditions and the quantitative-qualitative composition of ichthyopopulations are at a satisfactory level for all indigenous fish species.

Keywords: *Fojnica; fishing waters; ichthyopopulation; electrofishing; ichthyological research*

INTRODUCTION

The richness and diversity of flora and fauna in Bosnia and Herzegovina are most clearly manifested through the abundance and diversity of fish species that inhabit its waters (Muhamedagić, 2019). Fish in Bosnia and Herzegovina are represented by 118 (sub)species, classified into 70 genera and 27 families. Of the 118 registered (sub)species, 105 are indigenous, and 13 (sub)species have been introduced into the waters of Bosnia and Herzegovina (Vuković, 1977; Sofradžija, 2009). The first ichthyological research in the waters of Bosnia and Herzegovina were conducted in the

* Paper presented at the 34th International Scientific-Expert Conference of Agriculture and Food Industry, October 9-11, 2024, Sarajevo, Bosnia and Herzegovina

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19th century, during the Austro-Hungarian Monarchy. The works of Heckel and Kner (1858), Steindachner (1882) and Heintz (1908) collected significant data on the distribution of salmonid fish species in this area and their biosystematic affiliation.

From the beginning of the 20th century until today, the ichthyofauna of Bosnia and Herzegovina has been a subject of interest for domestic and foreign ichthyologists and has been presented in numerous studies of the Yugoslav and European ichthyofauna (Ćurčić, 1915, 1916; Karaman, 1926, 1928, 1932, 1937, 1938, 1952; Taler, 1950, 1953a, 1953b; Vuković & Ivanović, 1971; Vuković, 1977; Vuković & Sofradžija, 1987; Kottelat, 1997; Kottelat & Freyhof, 2007; Sofradžija, 2009).

Ichthyological research in the Fojnička River basin has been conducted on several occasions over the last twenty years (Korjenić, 2003a, 2003b, 2004a, 2004b, 2005a, 2005b, 2005c, 2006, 2009; Korjenić & Sofradžija, 2005; Korjenić *et al.*, 2009; Žujo & Korjenić, 2005; Škrijelj *et al.*, 2008; Pavličević *et al.*, 2014). In ichthyological research conducted in 2008, a total of 6 fish species from 4 families of freshwater ichthyofauna were registered in the fishing waters of the Fojnica municipality (Škrijelj *et al.*, 2008).

The goal of the ichthyological research in this study is to determine the current status of fish populations and to obtain relevant data on the representation of certain fish species in the fishing waters of the Fojnica municipality. The results of the ichthyological analyses regarding the status of fish populations, their qualitative-quantitative structure, and their comparison with the status of these populations during previous studies in these fishing waters should provide an overview of the fish stock, specifically whether a population is declining, stagnating or increasing.

MATERIALS AND METHODS

The field part of the ichthyological research of fishing waters in the Fojnica municipality was conducted from October 29 to 30, 2019, and the fishing waters as well as the localities where the research was carried out are presented in Table 1.

Fish were caught using an electrofishing generator "Honda" OHV 5.5, with a power of 3.0 kW. The collected fish samples were processed in the field and returned to their natural habitat, while a smaller number of representative specimens were fixed in 4% formaldehyde and transported to the laboratory of the Center for Aquaculture and Fisheries at the Faculty of Agriculture and Food Sciences in Sarajevo for further analysis.

Table 1. Processed water surfaces

Fishing water	Locality	Length of the locality (m)	Width of the locality (m)
Fojnička River	Šćitovo	100.0	12.0
Željeznica	Bakovići	100.0	8.0
Radava	Praje	100.0	3.0
Brložnjak	Dusina	100.0	3.0
Dragača	Urban zone	100.0	6.0
Požarna	Požarna	100.0	5.0
Borovnica	Tovarište	100.0	3.0
Hrastinčica	Tovarište	100.0	2.0
Kozica	Mehurići	100.0	2.0
Jezernica	Mouth of the Razdolja	100.0	3.0
Šćona	Pavlovac	100.0	4.0

The systematic determination of fish was conducted according to Vuković & Ivanović (1971): *Ribe Bosne i Hercegovine*; and Kottelat & Freyhof (2007): *Handbook of European Freshwater Fishes*.

RESULTS AND DISCUSSION

The municipality of Fojnica is located approximately between 43°47' and 44°28' N, which practically means it is located almost halfway between the equator and the northern geographic pole. The main characteristic of the hydrographic network in the Fojnica municipality is its overall territorial affiliation with the Black Sea river basin. The backbone of this hydrographic network is the Fojnička River. The total length of all watercourses in the Fojnica municipality, determined by planimetry of the lengths of watercourses from topographic maps at a scale of 1:25 000, is approximately 170.00 km. Accordingly, the average length of the main watercourses is about 0.57 km/km², which is slightly above the Bosnian-Herzegovinian average.

Fojnička River

The quantitative-qualitative composition of the ichthyofauna of the Fojnička River (locality Šćitovo) and the proportion of individual fish species in the total ichthyopopulation are presented in Table 2 and Figure 1.

Table 2. Qualitative-quantitative composition of the ichthyopopulation of the Fojnička River in the locality of Ščitovo

Species	Quantity	Body weight (g)			Total length (cm)	
		max	min	Σ	max	min
Brown trout	60	862.0	226.0	32 640.0	45.0	30.0
Rainbow trout	1	30.0	30.0	30.0	15.0	15.0
Huchen	4	⁴ 520.0	488.0	10 016.0	72.5	38.0
Grayling	34	158.0	9.0	2 839.0	27.0	8.0
Chub	37	288.0	7.0	5 457.5	28.0	8.5
Eurasian minnow	120	10.0	6.0	960.0	9.0	7.0
Schneider	162	18.0	11.0	2 349.0	12.5	8.5
Danube barbel	13	26.0	18.0	286.0	21.5	16.0
Bullhead	40	11.0	7.0	360.0	11.5	9.5
Total	471	-	-	54 937.5	-	-

At the Ščitovo locality, in the Fojnička River, nine fish species have been recorded: four from the Salmonidae family (brown trout – *Salmo trutta*, rainbow trout – *Oncorhynchus mykiss*, huchen – *Hucho hucho* and grayling – *Thymallus thymallus*), three from the Leuciscidae family (chub – *Squalius cephalus*, Eurasian minnow – *Phoxinus phoxinus* and schneider – *Alburnoides bipunctatus*), as well as one species each from the Cyprinidae family (Danube barbel – *Barbus balcanicus*) and the Cottidae family (bullhead – *Cottus gobio*). A total of 471 specimens were caught, with a total body weight of 54.9 kg.

Compared to ichthyological research conducted for the purpose of developing the fisheries baseline document (Škrijelj *et al.*, 2008) and the revision of the fisheries baseline document (Pavličević *et al.*, 2014), four new fish species were recorded in this watercourse: huchen, rainbow trout, chub and schneider

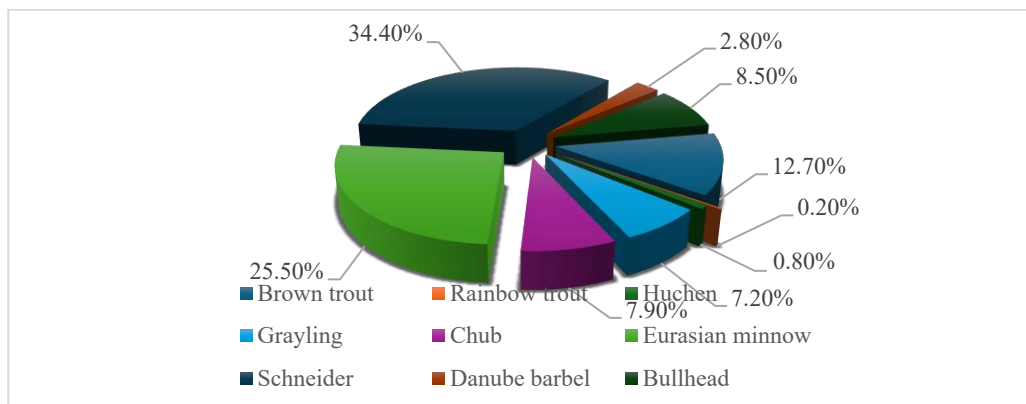


Figure 1. Qualitative-quantitative composition of the ichthyopopulation of the Fojnička River in the locality of Šćitovo

The largest share of the ichthyopopulation in the Fojnička River, at the Šćitovo locality, is made up of fish species from the Leuciscidae family (67.8%), of which the most common are schneider (34.4%) and Eurasian minnow (25.5%), while chub makes up 7.9% of the total ichthyopopulation. Salmonid fish species are represented in this locality with a share of 20.9% of the total ichthyopopulation. Brown trout is represented with a share of 12.7%, grayling with 7.2%, huchen with 0.8% and rainbow trout with 0.2% in the total ichthyopopulation. Bullhead, as the only representative of the Cottidae family, is represented with a share of 8.5%. A not so significant share of the ichthyopopulation is made up of the Danube barbel, a representative of the Cyprinidae family, with only 2.8% of the total ichthyopopulation of the Fojnička River at the Šćitovo locality.

Željeznica River

The quantitative-qualitative composition of the ichthyofauna of the Željeznica River (locality Bakovići) and the proportion of individual fish species in the total ichthyopopulation are presented in Table 3 and Figure 2.

Table 3. Qualitative-quantitative composition of the ichthyopopulation of the Željeznica River in the locality Bakovići

Species	Quantity	Body weight (g)			Total length (cm)	
		max	min	Σ	max	min
Brown trout	107	372.0	18.0	20 865.0	37.5	13.5
Grayling	46	286.0	18.0	6 992.0	33.5	14.0
Bullhead	26	12.0	8.0	260.0	11.5	9.0
Total	179	-	-	28 117.0	-	-

In the Željeznica River, at the Bakovići locality, three fish species have been registered: brown trout (*Salmo trutta*) and grayling (*Thymallus thymallus*) from the Salmonidae family, and bullhead (*Cottus gobio*) from the Cottidae family. A total of 179 specimens were caught, with a total body weight of 28.1 kg.

During this research, populations of rainbow trout, Danube barbel and Eurasian minnow were not recorded, but they were present in the overall ichthyopopulation in earlier studies (Škrijelj *et al.*, 2008; Pavličević *et al.*, 2014).

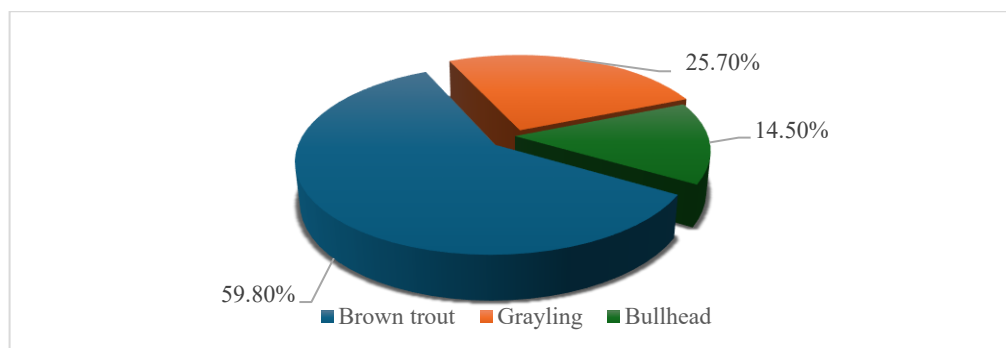


Figure 2. Qualitative-quantitative composition of the ichthyopopulation of the Željeznica River in the locality Bakovići

The largest share of the total ichthyopopulation in the Željeznica River, at the Bakovići locality, is made up of salmonid fish species – brown trout and grayling. Brown trout is represented with a share of 59.8%, and grayling with a share of 25.7% in the total ichthyopopulation, meaning that salmonids comprise 85.5% of the total ichthyopopulation at this locality. Bullhead is represented with a share of 14.5%.

Radava River

The quantitative-qualitative composition of the ichthyofauna of the Radava River (locality Praje) and the proportion of individual fish species in the total ichthyopopulation are presented in Table 4 and Figure 3.

Table 4. Qualitative-quantitative composition of the ichthyopopulation of the Radava River in the locality of Praje

Species	Quantity	Body weight (g)			Total length (cm)	
		max	min	Σ	max	min
Brown trout	52	22.0	6.0	728.0	13.5	8.5
Rainbow trout	2	12.0	9.0	21.0	9.5	7.5
Bullhead	24	22.0	9.0	372.0	12.0	10.0
Total	78	-	-	1121.0	-	-

In the Radava River, three fish species have been recorded: two from the Salmonidae family (brown trout – *Salmo trutta* and rainbow trout – *Oncorhynchus mykiss*) and one species from the Cottidae family (bullhead – *Cottus gobio*). A total of 78 fish specimens were caught, with a total body weight of 1.1 kg.

In addition to brown trout and bullhead, species recorded during the studies conducted in 2008 (Škrijelj *et al.*, 2008) and 2014 (Pavličević *et al.*, 2014), this research also recorded two specimens of rainbow trout, which likely escaped from a fish farm.

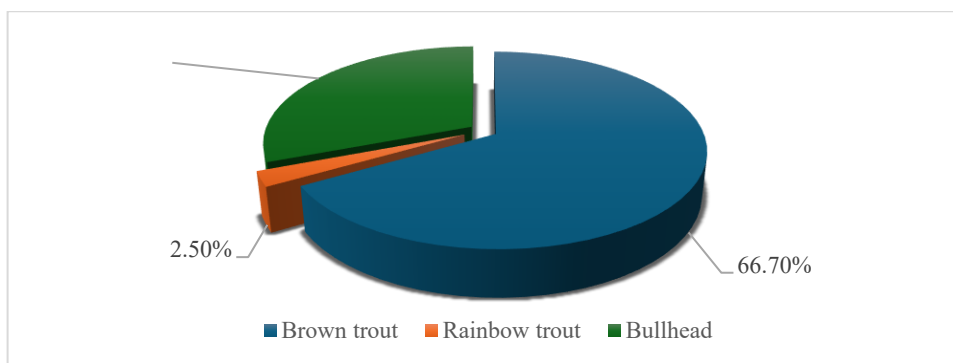


Figure 3. Qualitative-quantitative composition of the ichthyopopulation of the Radava River in the locality of Praje

The largest share of the ichthyopopulation in the Radava River, at the Praje locality, is made up of salmonid fish species, with a share of 69.2%. The most represented is the brown trout, with a share of 66.7%, while the rainbow trout makes up 2.5% of the total ichthyopopulation. A significant part of the ichthyopopulation in this area is also composed of the bullhead, with a 30.8% share of the total ichthyopopulation in the Radava River at the Praje locality.

Brložnjak Stream

The quantitative-qualitative composition of the ichthyofauna of the Brložnjak Stream (locality Dusina) and the proportion of individual fish species in the total ichthyopopulation are presented in Table 5 and Figure 4.

Table 5. Qualitative-quantitative composition of the ichthyopopulation of the Brložnjak Stream in the locality of Dusina

Species	Quantity	Body weight (g)			Total length (cm)	
		max	min	Σ	max	min
Brown trout	36	31.0	10.0	738.0	15.0	9.5
Bullhead	16	19.0	9.0	224.0	11.0	9.5
Total	52	-	-	962.0	-	-

In the Brložnjak Stream, two fish species have been recorded: one from the Salmonidae family (brown trout – *Salmo trutta*) and one from the Cottidae family (bullhead – *Cottus gobio*). A total of 52 fish specimens were caught, with a total body weight of approximately 1.0 kg.

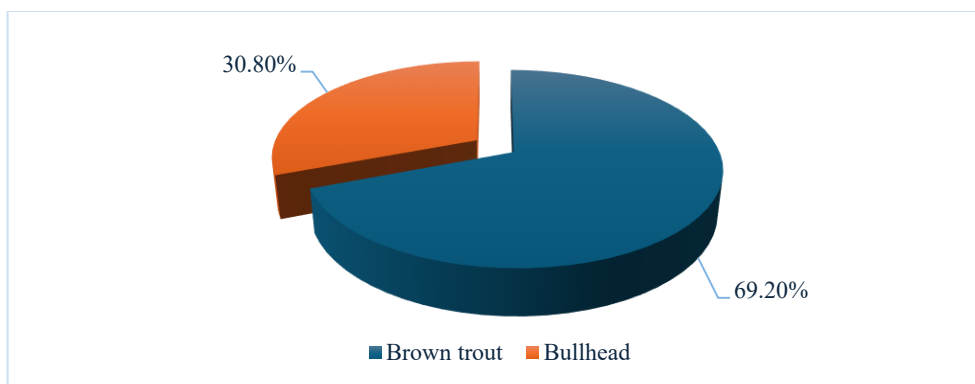


Figure 4. Qualitative-quantitative composition of the ichthyopopulation of the Brložnjak Stream in the locality of Dusina

The largest share, about 2/3 of the total ichthyopopulation in the Brložnjak Stream, at the Dusina locality, is made up of brown trout (69.2%), of all age categories. The rest of the ichthyopopulation is made up of bullhead, with a 30.8% share in the total ichthyopopulation of the Brložnjak Stream, at the Dusina locality.

Dragača River

The quantitative-qualitative composition of the ichthyofauna of the Dragača River, in the urban zone area, and the proportion of individual fish species in the total ichthyopopulation are presented in Table 6 and Figure 5.

Table 6. Qualitative-quantitative composition of the ichthyopopulation of the Dragača River, urban zone

Species	Quantity	Body weight (g)			Total length (cm)	
		max	min	Σ	max	min
Brown trout	95	840.0	32.0	41 420.0	41.0	15.0
Rainbow trout	2	905.0	49.0	954.0	38.5	17.0
Bullhead	28	22.0	5.0	378.0	12.5	7.0
Total	125	-	-	42752.0	-	-

In the Dragača River, three fish species have been recorded: two species from the Salmonidae family (brown trout – *Salmo trutta* and rainbow trout – *Oncorhynchus mykiss*) and one from the Cottidae family (bullhead – *Cottus gobio*). A total of 125 fish specimens were caught, with a total body weight of 42.7 kg.

Compared to the research from 2008 (Škrijelj *et al.*, 2008), it can be concluded that there were no significant changes in the composition of the ichthyopopulation of the Dragača River.

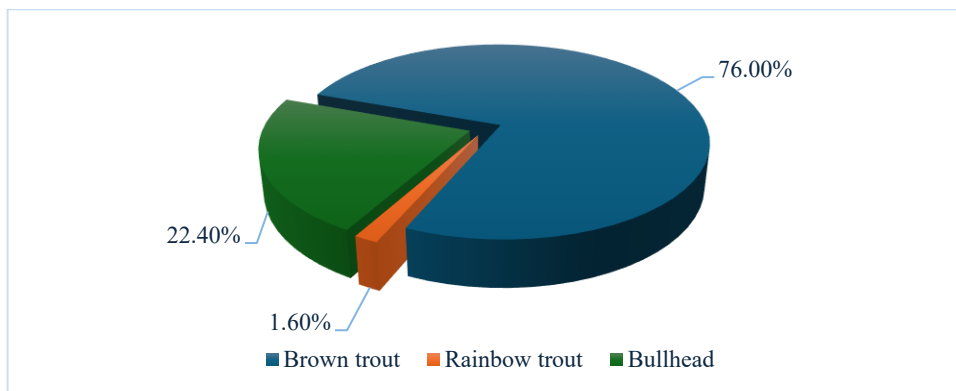


Figure 5. Qualitative-quantitative composition of the ichthyopopulation of the Dragača River (urban zone)

The largest share of the ichthyopopulation in the Dragača River (the urban zone area) is made up of brown trout with a share of 76.0% of the total ichthyopopulation. Rainbow trout is represented with a share of 1.6%. Therefore, salmonids are represented with a share of 77.6% in the total ichthyopopulation. Bullhead is represented with a share of 22.4% in the total ichthyopopulation of the Dragača River, in the urban zone area.

Požarna River

The quantitative-qualitative composition of the ichthyofauna of the Požarna River (locality Požarna) and the proportion of individual fish species in the total ichthyopopulation are presented in Table 7 and Figure 6.

Table 7. Qualitative-quantitative composition of the ichthyopopulation of the Požarna River in the locality of Požarna

Species	Quantity	Body weight (g)			Total length (cm)	
		max	min	Σ	max	min
Brown trout	93	105.0	10.0	5 347.5	21.0	8.0
Bullhead	33	34.0	11.0	742.5	12.0	7.0
Total	126	-	-	6 090.0	-	-

In the Požarna River, at the Požarna locality, two species of fish were registered: one from the Salmonidae family (brown trout – *Salmo trutta*) and one species from the Cottidae family (bullhead – *Cottus gobio*). A total of 126 fish specimens were caught, with a total body weight of about 6.0 kg.

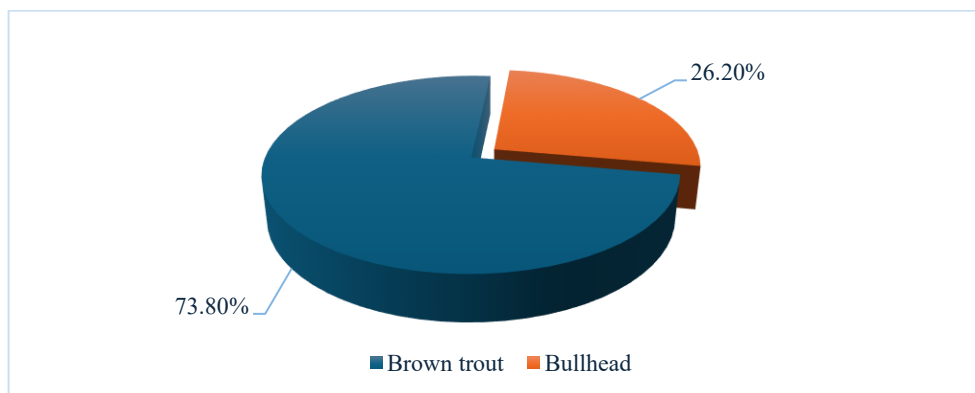


Figure 6. Qualitative-quantitative composition of the ichthyopopulation of the Požarna River in the locality of Požarna

The largest share of the total ichthyofauna in the Požarna River is made up of brown trout, accounting for 73.8%. The remaining ichthyofauna is composed of the bullhead, with a share of 26.2% in the total ichthyofauna of the Požarna River, at the Požarna locality.

Borovnica River

The quantitative-qualitative composition of the ichthyofauna of the Borovnica River (locality Tovarište) and the proportion of individual fish species in the total ichthyopopulation are presented in Table 8 and Figure 7.

Table 8. Qualitative-quantitative composition of the ichthyopopulation of the Borovnica River (locality Tovarište)

Species	Quantity	Body weight (g)			Total length (cm)	
		max	min	Σ	max	min
Brown trout	93	24.0	6.0	1 395.0	13.5	7.5
Bullhead	12	18.0	7.0	150.0	10.5	7.5
Total	105	-	-	1 545.0	-	-

In the Borovnica River, two species of fish have been recorded: one from the Salmonidae family (brown trout – *Salmo trutta*) and one from the Cottidae family (bullhead – *Cottus gobio*). A total of 105 fish specimens were caught, with a total body weight of approximately 1.5 kg.

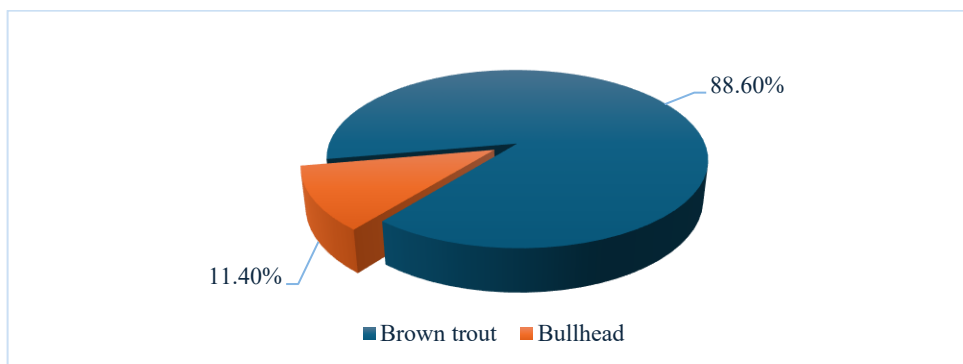


Figure 7. Qualitative-quantitative composition of the ichthyopopulation of the Borovnica River in the locality of Tovarište

The largest share in the Borovnica River (Tovarište locality) is made up of brown trout (88.6%), of all age categories. The rest of the ichthyofauna is made up of bullhead, with a share of 11.4% in the total fish population of the Borovnica River.

Hrastinčica River

The quantitative-qualitative composition of the ichthyofauna of the Hrastinčica River (locality Tovarište) and the proportion of individual fish species in the total ichthyopopulation are presented in Table 9.

Table 9. Qualitative-quantitative composition of the ichthyopopulation of the Hrastinčica River (locality Tovarište)

Species	Quantity	Body weight (g)			Total length (cm)	
		max	min	Σ	max	min
Brown trout	48	15.0	4.0	456.0	11.0	7.0
Total	48	-	-	456.0	-	-

Only one fish species belonging to the Salmonidae family (brown trout – *Salmo trutta*) has been registered in the Hrastinčica River. A total of 48 specimens of this species were caught, with a total body mass of about 0.5 kg.

Kozica River

The quantitative-qualitative composition of the ichthyofauna of the Kozica River (locality Mehurići) and the proportion of individual fish species in the total ichthyopopulation are presented in Table 10.

Table 10. Qualitative-quantitative composition of the ichthyopopulation of the Kozica River in the locality of Mehurići

Species	Quantity	Body weight (g)			Total length (cm)	
		max	min	Σ	max	min
Brown trout	30	14.0	9.0	345.0	11.0	8.5
Total	30	-	-	345.0	-	-

In the Kozica River, one fish species has been recorded, the brown trout (*Salmo trutta*), which belongs to the Salmonidae family. A total of 30 specimens of this fish were caught, with a total body weight of approximately 0.3 kg.

Jezernica River

The quantitative-qualitative composition of the ichthyofauna of the Jezernica River (locality mouth of the Razdolja) and the proportion of individual fish species in the total ichthyopopulation are presented in Table 11 and Figure 8.

Table 11. Qualitative-quantitative composition of the ichthyopopulation of the Jezernica River (mouth of the Razdolja)

Species	Quantity	Body weight (g)			Total length (cm)	
		max	min	Σ	max	min
Brown trout	87	42.0	5.0	2 044.5	16.5	7.5
Bullhead	30	11.0	3.0	210.0	10.0	6.0
Total	117	-	-	2 254.5	-	-

In the Jezernica River (mouth of the Razdolja locality), two fish species have been recorded: one from the Salmonidae family (brown trout – *Salmo trutta*) and one from the Cottidae family (bullhead – *Cottus gobio*). A total of 117 fish specimens were caught, with a total body weight of approximately 2.2 kg.

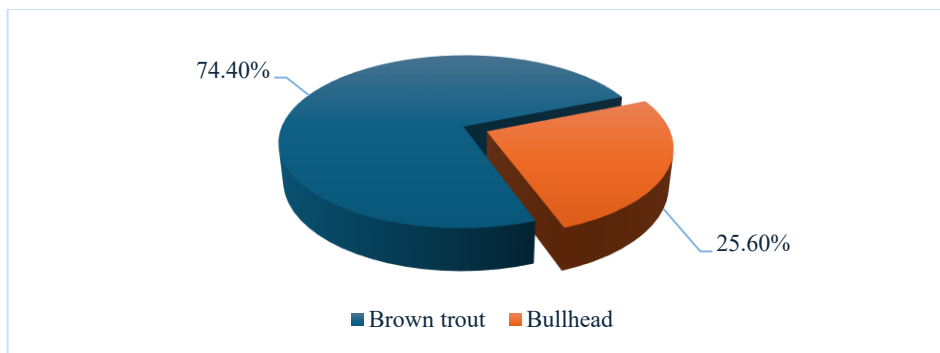


Figure 8. Qualitative-quantitative composition of the ichthyopopulation of the Jezernica River in the locality mouth of the Razdolja

The largest share of the total ichthyofauna in the Jezernica River, at the mouth of Razdolja locality, is made up of brown trout, accounting for 74.4%. The remaining ichthyopopulation is composed of the bullhead, with a share of 25.6% in the total ichthyofauna of the Jezernica River.

Šćona River

The quantitative-qualitative composition of the ichthyofauna of the Šćona River (locality Pavlovac) and the proportion of individual fish species in the total ichthyopopulation are presented in Table 12 and Figure 9.

Table 12. Qualitative-quantitative composition of the ichthyopopulation of the Šćona River in the locality of Pavlovac

Species	Quantity	Body weight (g)			Total length (cm)	
		max	min	Σ	max	min
Brown trout	59	74.0	10.0	2 478.0	18.5	10.5
Bullhead	34	23.0	5.0	476.0	12.0	6.5
Total	93	-	-	2 954.0	-	-

Two fish species were registered in the Šćona River: one from the Salmonidae family (brown trout - *Salmo trutta*) and one from the Cottidae family (bullhead – *Cottus gobio*). A total of 93 fish were caught, with a total body weight of about 3.0 kg.

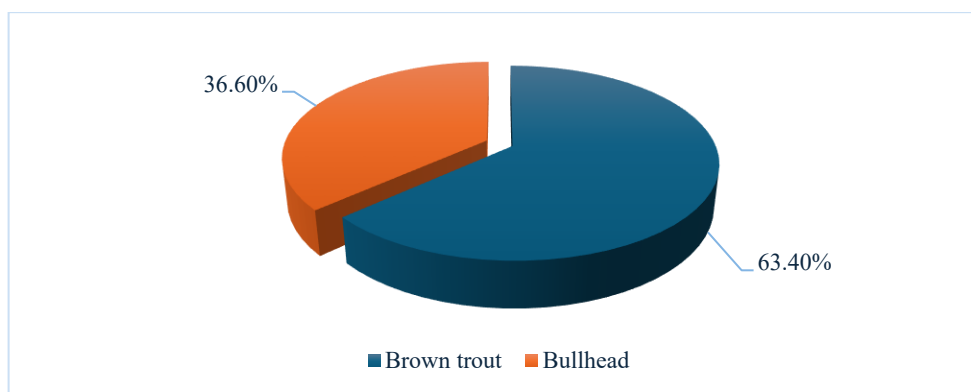


Figure 9. Qualitative-quantitative composition of the ichthyopopulation of the Šćona River in the locality of Pavlovac

The largest share of the total fish population in the Šćona River is made up of brown trout (63.4%), of all age categories. The rest of the fish population is made up of bullhead, with a 36.6% share in the total fish population of the Šćona River (Pavlovac locality).

Summary analysis of the qualitative-quantitative structure of the ichthyopopulation

In ichthyological research of fishing waters in the area of Fojnica municipality, 9 fish species from four families of freshwater ichthyofauna were registered. The results of the qualitative composition of the ichthyofauna of fishing waters in the area of Fojnica municipality are presented in table 13 and figures 10 and 11.

Table 13. Systematic review of the ichthyopopulation of fishing waters in the area of Fojnica municipality

Family	Species
Salmonidae	Brown trout (<i>Salmo trutta</i>)
	Huchen (<i>Hucho hucho</i>)
	Grayling (<i>Thymallus thymallus</i>)
	Rainbow trout (<i>Oncorhynchus mykiss</i>)
Leuciscidae	Chub (<i>Squalius cephalus</i>)
	Eurasian minnow (<i>Phoxinus phoxinus</i>)
	Schneider (<i>Alburnoides bipunctatus</i>)
Cyprinidae	Danube barbel (<i>Barbus balcanicus</i>)
Cottidae	Bullhead (<i>Cottus gobio</i>)

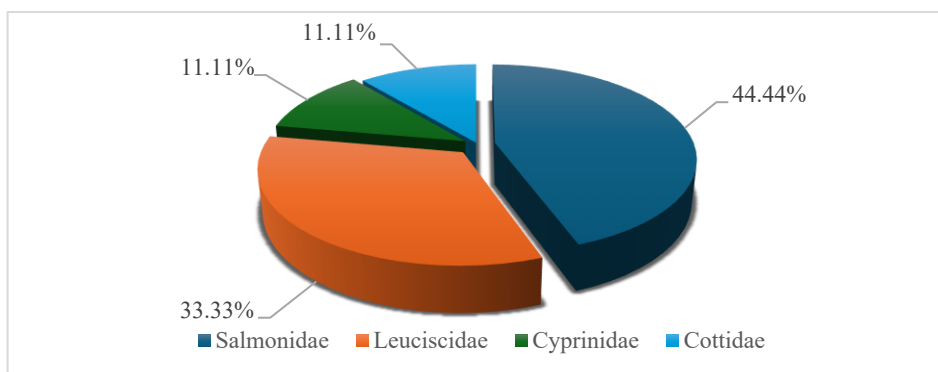


Figure 10. Percentage representation of the ichthyofauna of fishing waters in the area of Fojnica municipality

The salmonid family is represented by four species (44.44%) in the fishing waters of Fojnica municipality – three indigenous species and one allochthonous (non-native) species. Brown trout (*Salmo trutta*), huchen (*Hucho hucho*) and grayling (*Thymallus thymallus*) are indigenous species, while rainbow trout (*Oncorhynchus mykiss*) is allochthonous fish species. The Leuciscidae family is represented in these fishing waters by 3 registered species – 33.33% (chub – *Squalius cephalus*, Eurasian minnow – *Phoxinus phoxinus* and schneider – *Alburnoides bipunctatus*). With one species each (11.11%), the family Cyprinidae (Danube barbel – *Barbus balcanicus*) and the family Cottidae (bullhead – *Cottus gobio*) are represented in the fishing waters of Fojnica municipality.

During field research conducted in 2008 (Škrijelj *et al.*, 2008) and 2014 (Pavličević *et al.*, 2014) in the Fojnica municipality area, a total of six fish species from four families

of freshwater ichthyofauna were recorded: Salmonidae, Leuciscidae, Cyprinidae and Cottidae. The Salmonidae family was represented by three species (50.0%) – brown trout, grayling and rainbow trout. Other families were represented by one species each (16.67%) – the Leuciscidae family was represented by the Eurasian minnow, the Cyprinidae family by the Danube barbel, while the Cottidae family was represented by the bullhead. Comparing all three studies, it can be concluded that the latest research recorded three new fish species (huchen, chub and schneider) that were not registered in the previous studies from 2008 and 2014.

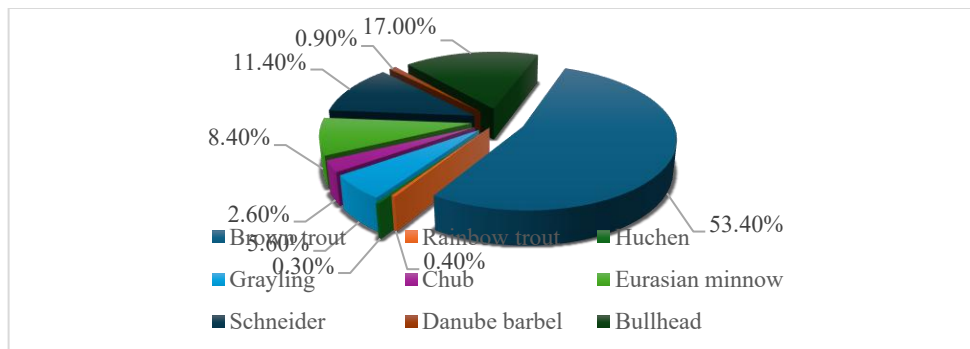


Figure 11. Percentage representation of the ichthyopopulations of investigated watercourses in the area of Fojnica municipality

The majority of the total ichthyopopulation of the studied watercourses in the Fojnica municipality area is made up of fish from the Salmonidae family with a total share of 59.7%. Therefore, fish from this family account for more than half of the total ichthyopopulation in this area – brown trout is the most dominant species representing 53.4%, followed by grayling with a share of 5.6%, rainbow trout with 0.4% and huchen with only 0.3%. Fish from the Leuciscidae family are represented with a total share of 22.4% – schneider with a share of 11.4%, European minnow with 8.4% and chub with a share of 2.6%. The rest of the ichthyopopulation of the studied watercourses in the Fojnica municipality includes the Danube barbel (Cyprinidae family) with a share of 0.9% and the bullhead (Cottidae family) with a share of 17,0%.

CONCLUSIONS

Based on the analysis of the results of field research conducted at representative localities on the rivers: Željeznica, Radava, Dragača, Požarna, Borovnica, Hrastinčica, Kozica, Jezernica, Šćona and the Fojnička River, as well as on the Brložnjak Stream, it can be concluded that the ecological conditions and the quantitative-qualitative composition of the ichthyopopulations are at a satisfactory level for all indigenous fish species. In the ichthyological research of fishing waters in the area of Fojnica

municipality, 9 fish species from four families of freshwater ichthyofauna were recorded: Salmonidae, Leuciscidae, Cyprinidae and Cottidae. Therefore, the results of the ichthyological research have undoubtedly shown that the current state of the fish stock in these waters is at a satisfactory level, especially regarding the populations of brown trout, huchen and grayling. Compared to the results of the ichthyological research conducted in 2008 for the purpose of developing the fisheries baseline document (Škrijelj *et al.*, 2008) and research conducted in 2014 for the purpose of developing the revision of the fisheries baseline document (Pavličević *et al.*, 2014), there have been no significant changes in the quantitative and/or qualitative composition of ichthyopopulations at most of the localities where research for this study was conducted. Significant changes in qualitative composition only occurred in the Fojnička River, where 4 new species were registered. In some watercourses and at certain localities, there has been an increase in the abundance of certain populations, leading to the conclusion that systematic efforts have been made in the past period to implement measures for the protection and improvement of fish stocks in the fishing waters of Fojnica municipality. It is very important to continue the current activities in the implementation of planned development measures, conservation and improvement of fish stocks, i.e. the diversity of ichthyopopulations in general, and one such measure is the stocking of fishing waters.

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POPULACIJE RIBA U RIBOLOVNIM VODAMA NA PODRUČJU OPĆINE FOJNICA

Sažetak

Ihtiološka istraživanja u ovoj studiji imala su za cilj utvrđivanje trenutnog stanja populacija riba, odnosno dobijanje relevantnih podataka o zastupljenosti pojedinih vrsta riba u ribolovnim vodama na području općine Fojnica. Terenski dio ihtioloških istraživanja ribolovnih voda na području općine Fojnica obavljen je tokom oktobra 2019. godine, na sljedećim vodotocima: Fojnička rijeka, Željeznica, Radava, Brložnjak, Dragača, Požarna, Borovnica, Hrastinčica, Kozica, Jezernica i Šćona. Izlov ribe je obavljen elektroagregatom za posebne namjene elektroribolova marke „Honda” OHV 5,5 (jačine 3.0 kW). Na terenu su obrađeni prikupljeni uzorci ribe, a zatim su sve jedinke vraćene u vodotok odakle su i izlovljene. U ihtiološkim istraživanjima ribolovnih voda na području općine Fojnica registrovano je 9 vrsta riba iz četiri porodice slatkovodne ihtiofaune. Sistematskom determinacijom je utvrđeno da je porodica Salmonidae zastupljena sa 4 registrovane vrste (44,44%), dok je porodica Leuciscidae zastupljena sa 3 vrste (33,33%). Sa po jednom registrovanom vrstom (11,11%) zastupljene su porodice Cyprinidae i Cottidae. Na osnovu analize rezultata terenskih istraživanja, provedenih na reprezentativnim lokalitetima gore navedenih vodotoka, može se konstatovati da su ekološki uslovi i kvantitativno-kvalitativni sastav ihtiopopulacija na zadovoljavajućem nivou za sve autohtone vrste riba.

Ključne riječi: *Fojnica; ribolovne vode; ihtiopopulacija; elektroribolov; ihtiološka istraživanja*