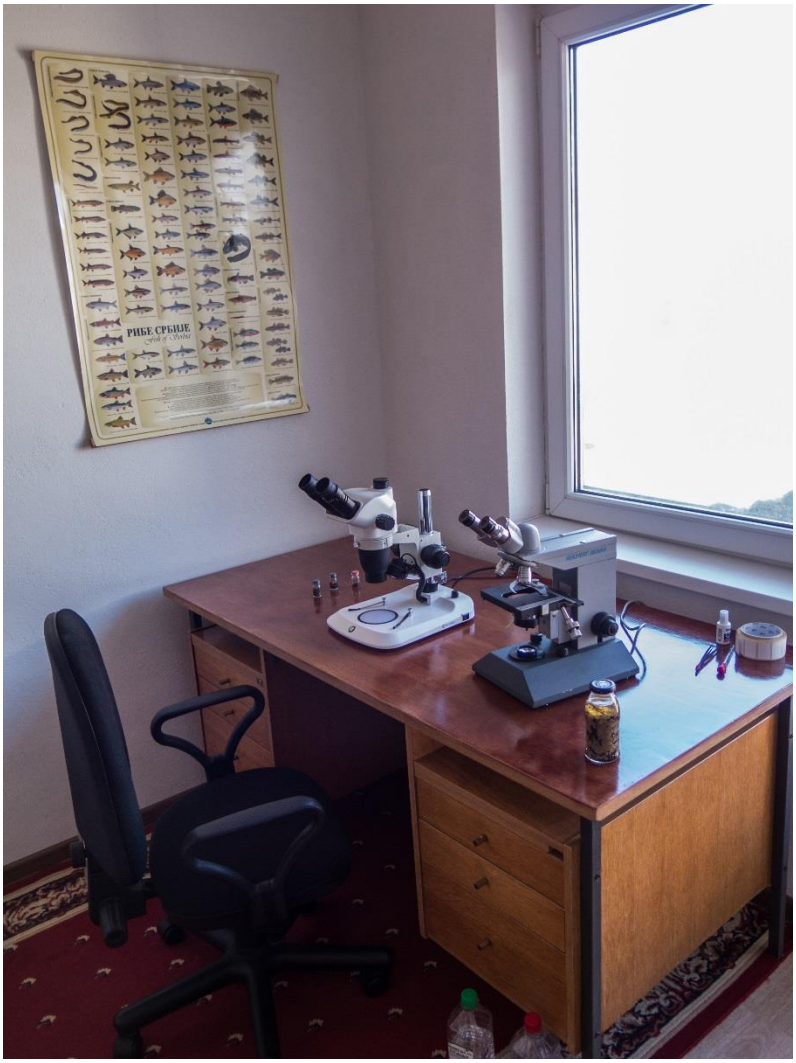
Project Update: January 2019

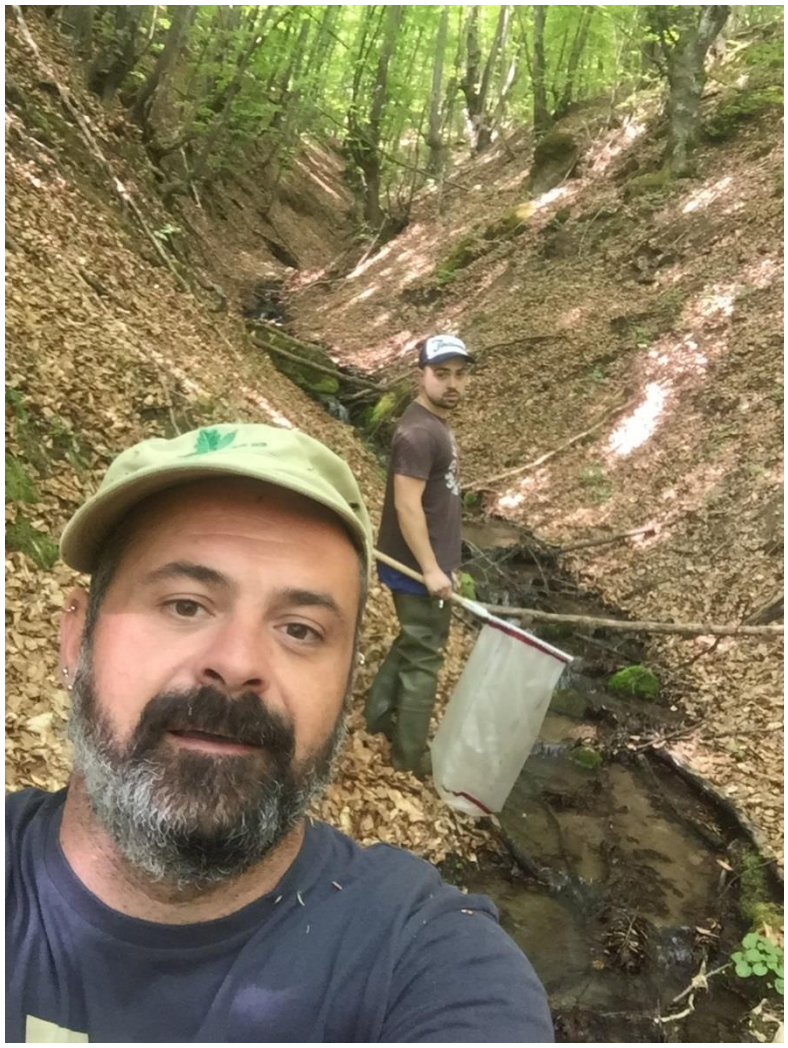
Project activities started shortly after the project was approved at the end of February 2018. In order to be able to start fieldwork and sample collection in the spring season, the most important activity at the beginning of the project was obtaining the necessary equipment. In addition to equipment for fieldwork, equipment for sample sorting and identification of organisms for equipping of the laboratory was also purchased.



The lab. ©Branislav Dimitrov

During that time, the project was presented to the general public and volunteers were invited to get involved in the project implementation. I have established contact and cooperation with the FAR internet portal, and on their website an article in form of an interview about the project realisation was published. Also, the project was presented to students of biology and ecology from the Faculty of Sciences and Mathematics in Niš and interested citizens at the Earth Hour 2018 event.

The first field visits were carried out at the end of April 2018, when the sampling was performed at the catchment of Poganovska River - 22 samples were collected there. It turned out that the area was extremely inaccessible and it was necessary, for most of the localities, to go by walking through a very impenetrable terrain while carrying with us heavy equipment, so that the collection of samples took more days than we have initially

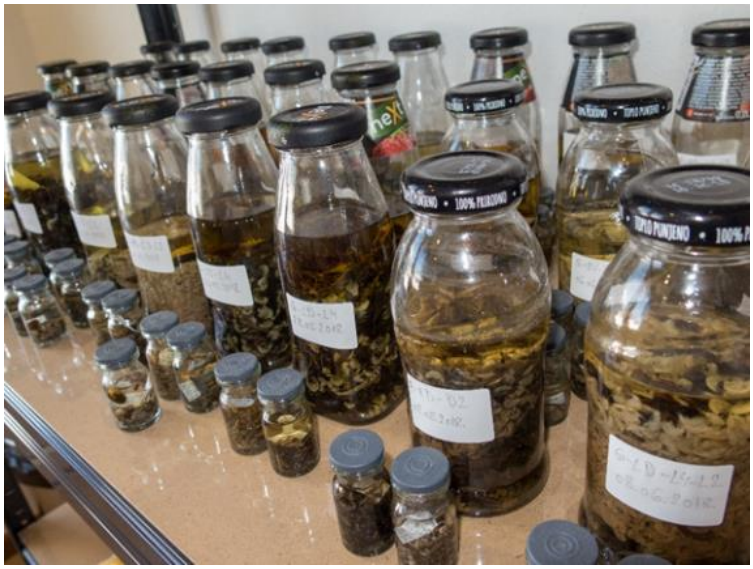


Sampling at the catchment of Poganovska River. ©Ivan Medenica

planned. Unfortunately, a smaller number of volunteers than expected were interested in project participation, which further slowed down the implementation of the project.

This has particularly affected the time needed for sorting out the samples, but also for the field work. For this reason, it was not possible to implement all of the field activities according to the protocol (sampling at all localities in every season), because such a procedure would have resulted in the entire project being reduced only to sampling and sorting with no sufficient time for identification and obtaining enough tangible results. Therefore, sampling was carried out at all planned sites (62) and in all seasons, but samples from different localities were taken in different periods of the year.

The main team members came to a compromise that for the ultimate goal of the project would be more effective results that will include sampling at all planned localities in one or two seasons rather than a small number of sites to be processed all the seasons. Sampling at some of the interesting sites will be repeated in different seasons during 2019.



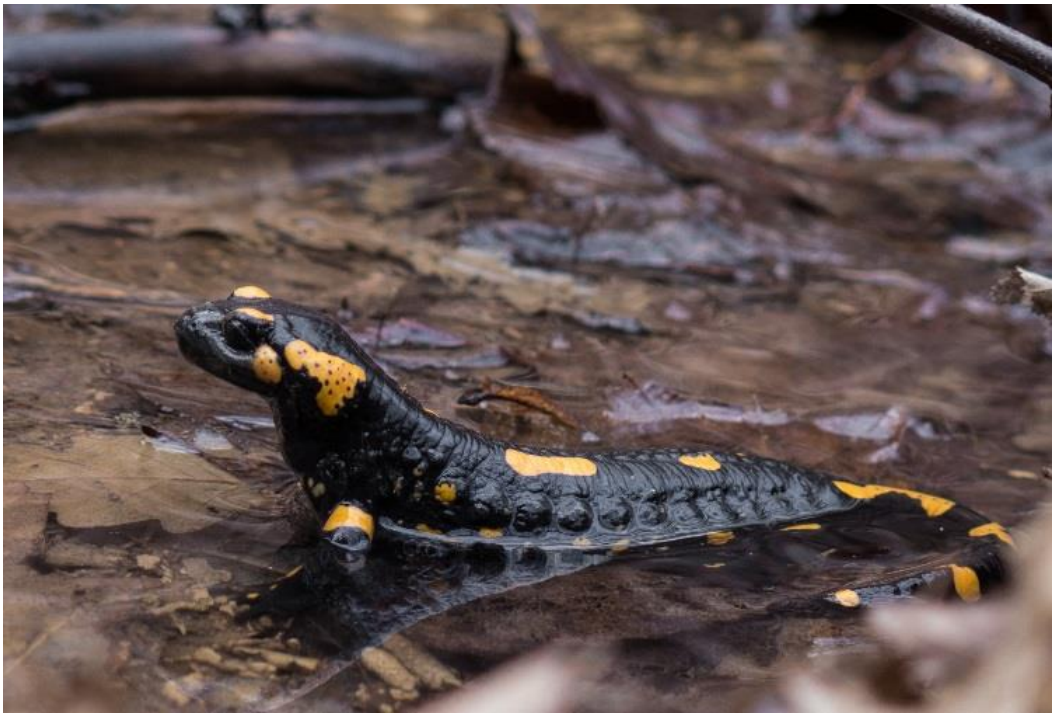
Sorting out of samples is at its final stage, after which we will focus on identification of organisms and data processing.

The results of the identification so far have confirmed the presence of the benthic macroinvertebrate species of international importance mentioned within the project proposal, and their presence in a greater number of new sites has been recorded: *Austropotamobius torrentium* (Decapoda) – within the entire catchment area of Željuška River, Nevljanska River catchment as a sub-catchment of the Gaberska River basin, two tributaries of Poganovska River; *Cordulegaster heros* (Odonata) - within a large number of watercourses; *Theodoxus transversalis* (Gastropoda) - individual watercourses within all three river basins. A presence of one endangered endemic species, which is strictly protected according to national laws in Serbia, has also been recorded - *Helicopsyche bacescui* (Trichoptera) - one stream within the Željuška River basin and several streams within the Poganovska River basin.

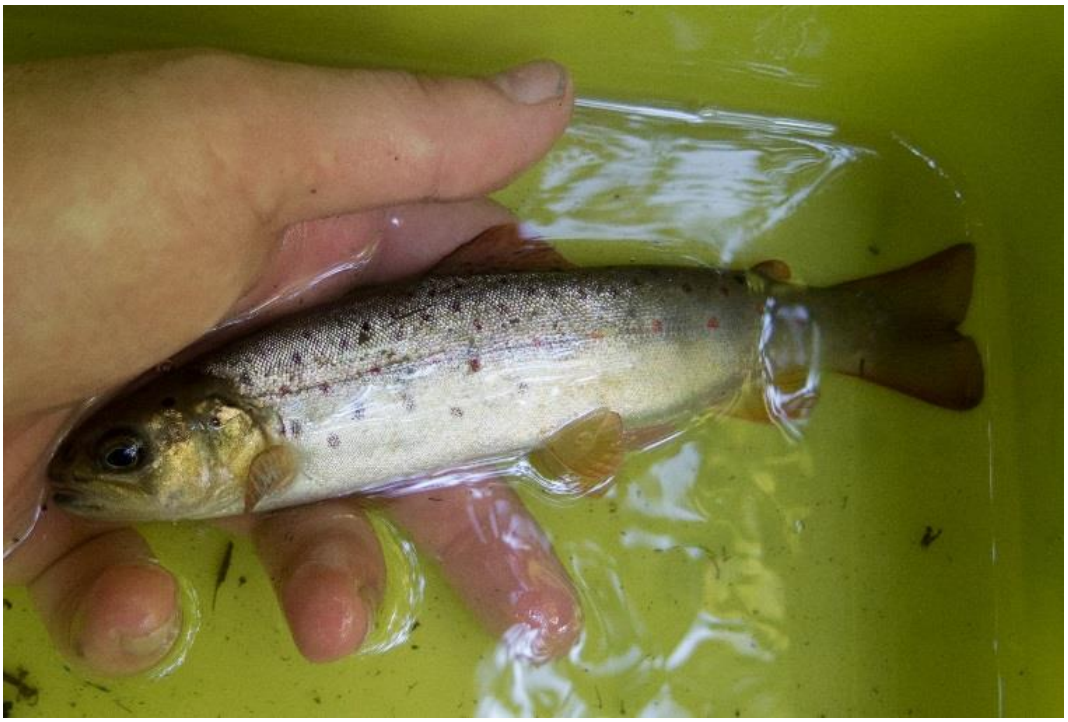
Helicopsyche bacescui. ©Branislav Dimitrov

In addition to macrozoobenthos, data on the presence of protected representatives of other groups of organisms of international and national importance were also recorded in the field. Among these, the following species show close and specific dependency on mountain streams: *Salamandra*, *Rana graeca*, *Bombina variegata*, *Bufo bufo*

(Amphibia)*; Cinclus* (Aves)*; Salmo trutta*, *Barbus balcanicus* (Pisces). Also, a nest of the golden eagle (*Aquila chrysaetos*) was noticed on a cliff within the canyon of one of the tributaries of Poganovska River, whose male specimen was observed flying in the immediate vicinity.



Salamandra salamandra. ©Branislav Dimitrov



Salmo trutta. ©Branislav Dimitrov

The Institute of Public Health from Pirot carried out a physicochemical analysis of water quality at seven characteristic localities within the three river basins (Poganovska Reka, Željuška Reka, Gaberska Reka), including the Nišava River. The localities were selected after previous visits of all watercourses planned for sampling of macrozoobenthos, with potential polluters being recorded. The analyses have shown that the Gaberska River enters Serbia from Bulgaria with already polluted water due to increased concentration of sulphates, with the source of pollution being the lignite mine located not far from the border on the Bulgarian territory in the immediate vicinity of the Gaberska River. The river on the Serbian territory receives several unpolluted tributaries and is partially purified upstream of the populated village of Lukavica, flows through Lukavica where catastrophic microbiological pollution occurs due to dysfunctional sewage system.

785REZULTATI MIKRO-BIOLOŠKIH ISPITIVANJA

ISPITANO PO: Metodama važećeg Pravilnika i Standarda

Red. br.	Parametar	Oznaka metode	Jed. mere	Dobijena vrednost	Napomena
1.	Ukupne koliformne bakterije	*MPN metoda 1.2.1*	100 ml	2300	
2.	Fekalne koliformne bakterije	*MPN metoda 2.2*	100 ml	400	
3.	Fekalne enterokoke	*MPN metoda 3.1*	100 ml	400	
4.	Broj aerobnih heterotrofa	*metoda po Kohl-u*	1 ml	13250	

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4.	Broj aerobnih heterotrofa	*metoda po Kohl-u*	1 ml	500000	

Gaberska River, upstream and downstream of Lukavica village – comparison of the microbiological analysis

The Nišava River follows a similar pattern but with organic contamination being more expressed than microbiological. At the time of the analysis Poganovska River showed a presence of moderate organic pollution, which is most likely derived from natural sources, since the sampling was carried out in November 2018 and a greater quantity of fallen leaves from deciduous forests was recorded. A small number of parameters were analysed on Željuška River downstream of inhabited houses of Gojin Dol village, at the confluence with the Nišava River. Pollutants were not registered, but since the analyses was not very detailed it is not possible to determine the water quality with high accuracy. After consultation with a hydrogeologist about possible contamination of stream water with heavy metals from the andesite quarry, he suggested that there was no need for this kind of analysis since no pollutants should be present.

There is a growing trend in construction of small hydropower plants of a derivative type in Serbia and the whole of the Balkans. The end result of their construction is represented by dry streambeds, since the flow of the watercourses is diverted into a pipeline along the route of several km and the destruction of the aquatic and riparian habitats. The amount of the produced electrical energy is insignificant in comparison to the damage that their construction implies, including breaking several national and international laws. Also, their construction is taking place despite the negative rescripts prescribed by the Institute for Nature Conservation of Serbia based on the presence of strictly protected and protected species as well as the condition of the stream ecosystems. For these

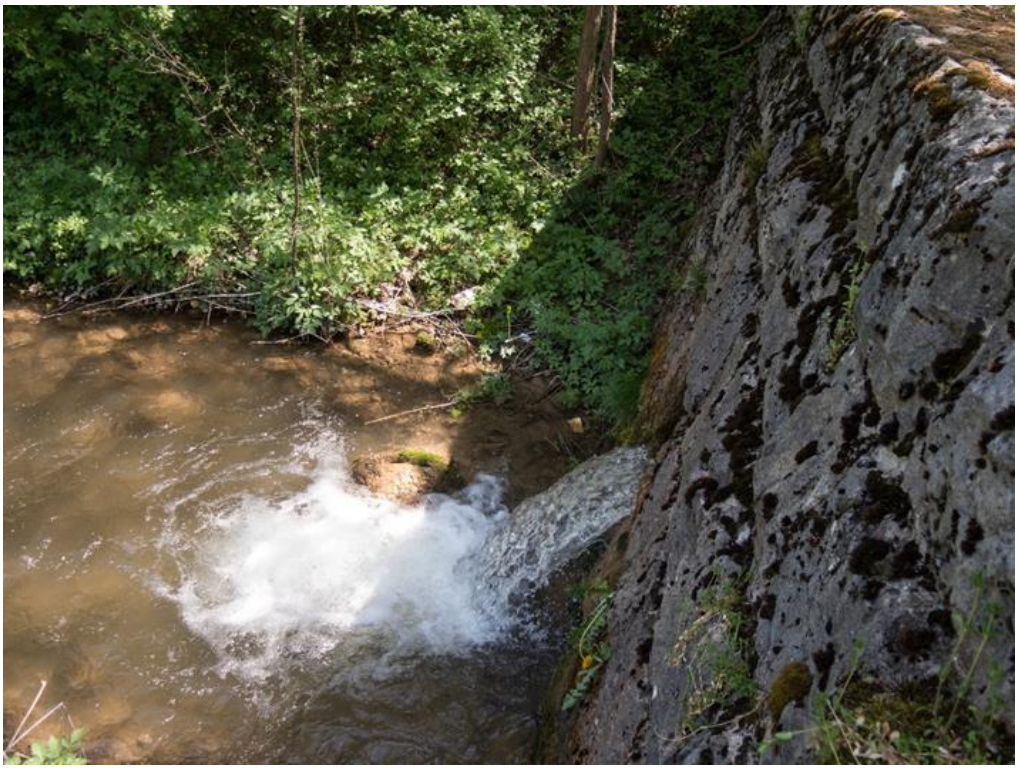
reasons, we organised a panel discussion in the National Library in Dimitrovgrad on justification of building small hydropower plants on the territory of the Pirot District. Representatives of the Institute for Nature Conservation of Serbia, the Public Company Srbijašume - as the manager of a number of protected areas in Serbia, several NGOs and interested citizens took part in the debate. I have also presented the results of the research we took so far while working on the project, by pointing out all of the protected species recorded in streams within unprotected areas on the territory of the Municipality of Dimitrovgrad, where the construction of small hydropower plants was planned. An article about the panel discussion was published on the website of the FAR internet portal.

At the moment, amendments to the landscape plan of the Municipality of Dimitrovgrad are in progress and there is an initiative to delete all of the marked locations for potential construction of small hydropower plants. In discussion with the authorities working within the local government of Dimitrovgrad Municipality, we came to an agreement to make such a request towards the spatial planning authorities. We will also use our project results as part of our arguments. If this plan works out, it will represent a big accopmlishment for protection of streams in Dimitrovgrad's Municipality and I believe it will encourage other municipalities to proceed in such a manner as well.

A stream from Gaberska River catchment.
©Branislav Dimitrov

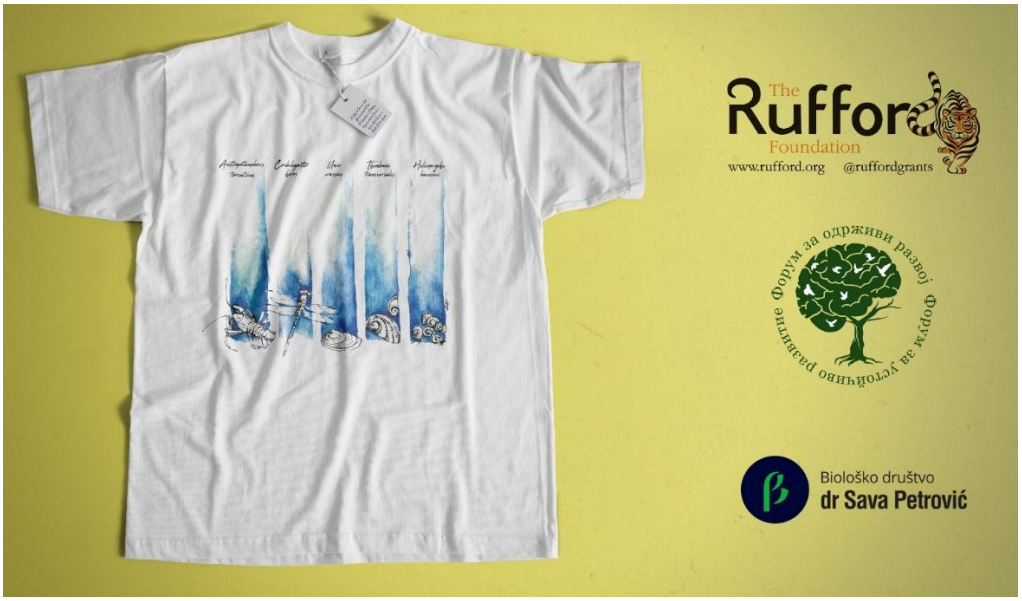
Other negative effects on mountain stream habitats that we noted in the field by observation and through contact with local residents were the following:

- forest cutting near the waterside, which results in lack of riparian vegetation leaving the water surface exposed to direct sunlight or leaving cut branches and logs within the riverbed, causing habitat degradation and eventually organic polution;
- construction of anti-erosion barriers in the past and potentially in the future, which causes habitat fragmentation of aquatic animals;
- spring water capture, which in combination with climate change (or climate change alone) has caused some streams to dry out in the driest period of the year for the first time in their history, or for the intermittent streams to be dry for extended period of time; this has also cased for the streams to have less amount of water for the longest part of the year.



Anti-erosion barrier on a stream from Poganovska River catchment. ©Ivan Medenica

Details about the project realization were presented to the general public on the official website of the Biological Society "Dr Sava Petrović". For the following stage of the project we plan to participate in promotional and educational activities more actively. For this purpose, a design for printing of t-shirts was prepared by Dimitrija Savić-Zdravković. Organising of the hydrobiological course for high school students has been postponed for the spring of this year.



T-shirt mockup, front and back side. ©Dimitrija Savić-Zdravković