

CYCLING THE DANUBE

CYCLING THE DANUBE - A TRIP TO THE NATURAL TREASURES ALONG THE DANUBE

3.000 Kilometers
10 Danube Countries
17 Protected Areas
120 DANUBEPARKS conservation actions

Within DANUBEparksCONNECTED, the Danube-wide flood prevention dyke evolves from its origin as flood prevention infrastructure to Green Infrastructure, linking valuable dry habitats. The flood prevention dyke along the Danube is a "corridor" not exclusively for animals and plants, but also for people: more and more tourists use the Euro Velo 6 for cycling and recreation.

Our professional cyclist Jovan Eraković is travelling along the EuroVelo 6 from 12th April to mid-June and visits all DANUBEPARKS Protected Areas to learn more about the implemented nature conservation activities of DANUBEparksCONNECTED.

Photo: Kern



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At the beginning

At the beginning of all big tasks it is always nice to actually start with something... So I liked it very much when I experienced such a positive development as well. The spring? Well a spring is of course important, but even more important is how the water behaves after it. Will it, without any further ambition, agree to just fill someone's bottle? Or will it soon hide underneath a stone and remain remembered only as being too lazy for the "success is 10% of talent and 90% of work" rule? Or will it actually grow into a serious and socially engaged river, the one that (besides all other things it offers) gives you even a chance to follow it three thousand kilometers on the bicycle? To be sure, my first stop on such a long trip was where one could already have certain confidence to this water.

So let's start with this: between Neuburg on the Danube and Ingolstadt lies one of the most important floodplain areas on the German Danube.

- District Neuburg - Schrobenhausen, City Ingolstadt, Germany
- Size: 2,927 hectares
- Established: 2005.

The **Danube riparian forest Neuburg-Ingolstadt** comprises the EU Flora-Fauna-Habitats Directive area 'Danube Floodplains with Gerolfinger oak forest' and parts of the Special Protection Area 'Danube Floodplain between the mouth of the Lech and Ingolstadt'. Its inheritance from the past is its very good preservation level - a happy consequence of the protection by the former Dukes of Bavaria as a hunting area. And today, one of the largest exterior dynamisation projects in Central Europe is currently taking place here.



Flood marks from 1991 and 2005. Except animals and plants, nobody else likes high water. But like it or not, it has an exceptional importance that can be compared only to the damage and misery it brings to human lives. The only solution? It should be kept far from settlements and enterprises. Easy to say, not easy (and cheap) to make it possible.

Which is even more important if we keep in mind that in last 100-150 years, due to all the dams built, Germany lost as much as 90% of its flooded areas.

A brave group against the frosty morning

Our guide: Siegfried Geißler, nature conservation authority for the district Neuburg-Schrobenhausen. Immediately after start we descended to the Berto-

ldsheim Danube reservoir, an important bird habitat. Two years ago a passage for fish was made near the dam - about 35 similar ones should be installed in Bavaria in the near future and each will cost from 1 to 5 million EUR. This one at 1.5 million EUR belongs to cheaper ones. But it isn't perfect, explains Siegfried: it is narrow and water flows through it quickly, making it unsuitable for some fish species.



The fish passage.



Antoniberg



On the forest road to Stepperg there is always something interesting to discuss.


The city of Ingolstadt: recognizing its part of the Danube paradise

The ride with Mr. Geißler ended in the castle Grünau. Another group of cyclists was already waiting there, led by Mr. **Thomas Schneider**, Danube and climate commissioner from Ingolstadt Department for health, climate protection, and environmental protection. Also with us is Dr. **Rupert Ebner**, a member of the Ingolstadt city Council and officer for health, climate protection and environment.

The castle hosts a modern outdoor visitor center opened in 2008. It was established by the district of Neuburg-Schrobenhausen, in order to underline the importance of the natural heritage and to support the renaturation of the Danube. The center is a „package“ of the entire competence of the European outdoor subject - from experiences of the past and awareness of the current situation to development of future visions and strategies for the region. It serves research, information of the public and the exchange of experience on the topic floodplain and river, thanks to the fact that it contains three main pillars under one roof, cooperating closely with each other: Aueninstitut, Aueninformationszentrum, and Auenforum.


One kilometer from the castle we crossed the stream Ott-Heinrich. This was actually a canal made in 2010 as a joint effort of Ingolstadt and Bavarian administration in order to turn the zone into a flooding area. (Do we want to put efforts and even money into creating of flooding areas? Off course we do... it is just a matter of choosing the right places.)



Ready for burn! !
Wait... is it dangerous? Ahem... not really,
see below.

Dr. Ebner's other serious life preoccupation is the "Slow Food". As a treasurer and international counselor, he preaches a food philosophy that is not much different from any fair ecology approach: „Food should be: good, clean and fair. "Good" (taste) does need more explanation, „clean" means that it should not contain any harmful ingredients and "fear" means that it should be produced without economic, social or political exploitation of the workforce and small manufacturers in general.

Brennen flächen

When a pebble bed gets colonized with plants adapted to such lean and dry site, a new special biotope, so-called "burn 

 is born. These semi-arid grasslands contain even a number of alpine plants that were transported by the river and its tributaries, and in the wake of the plants, diverse wildlife settles on. Orchids species, various gentians and other flowering plants, special insects, butterflies (some of them on the Red List of threatened animals in Bavaria) can be found in these dry, nutrient-poor habitats.

Considered as wastelands in the past, burnings are still endangered today. Thomas explains that the biotope we are looking at the moment supports its plants with app. 5 cm thick layer of hummus. Leaves and other organic material was brought by the river during periods of high water levels, but pebble was necessary to crush and grind that material into a fine-grained mass containing the necessary minimum amount of nutrients. Numerous hydroelectric power plants built in the second half of the 20th century block pebble transport and distribution along the river so the big "organic mill" barely works today.

"We need to bring more people to see burnings and to learn how important and at the same time how fragile they are", says Thomas. "We already had some actions of that type, but need to do even more."





Meeting at the castle Grünow



*On a dry grassland,
with Thomas explaining the details*



Grazing is important to keep dam sides in good condition. And herds consisting of sheep and goats (like this one) are an especially efficient tool: sheep cut the higher grass while goats do fine trimming, eating what is close to the ground.

Humans and animals: (how) can we live together? Which brings us to...

“Animal-Aided Design”: closing the gap between landscape architecture and conservation of the nature

„Ingolstadt Natur [] project to which Thomas is particularly proud as it brings a new quality in city’s habitat and offers a potential to bridge the gap between landscape architecture and nature conservation.

The basic idea behind it is that the „green infrastructure” is as important to the human society as other infrastructures such as electricity grids, road networks, etc.

Standard urban planning procedures do not create a green infrastructure. On the other hand, the focus of the nature conservation is usually just on sensitive remaining areas that already see little influence of hu-

mans – it does not target places with no wilderness left (including urban zones, off course). As a consequence, such places do not get in scope as candidates for green infrastructure. Urban planning and conservation actually often work against each other. Animal-Aided Design® is developed in cooperation with Dr.Thomas Hauck (University Kassel) as a methodology for open spaces design that can help to overcome this discordance. It includes the presence of animals as an integral part of the green infrastructure final concept:

- The desired species are chosen at the beginning of a project.
- The requirements of the target species (i.e. their life-cycles) then set a frame / boundary conditions and serve as an inspiration for the design.

You can find here a very interesting booklet that describes the whole concept in detail (in German only but shown design examples speak for themselves).

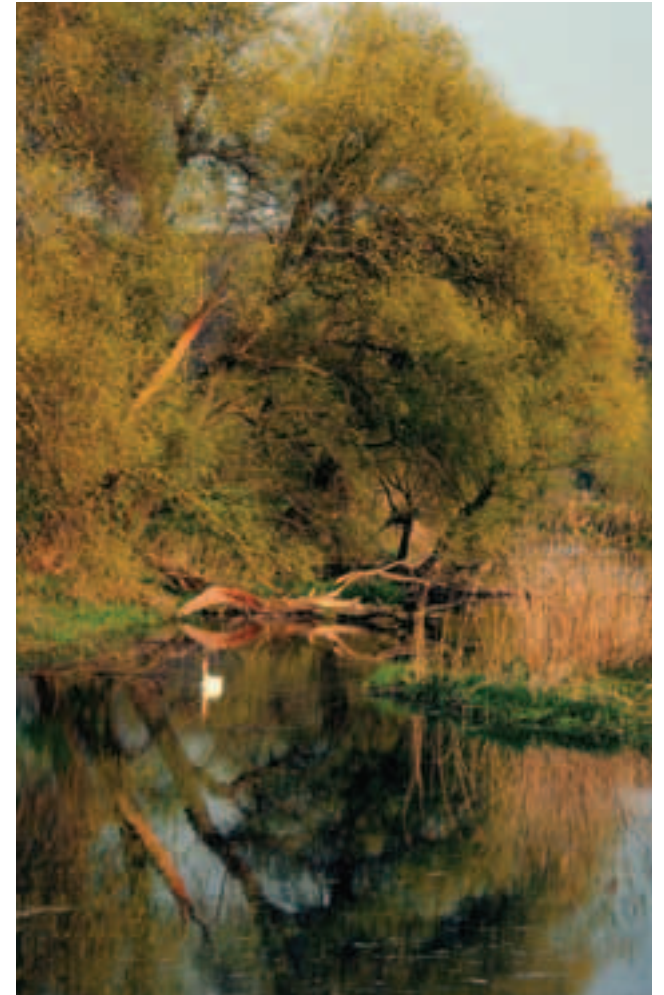


Kelheim to Windorf ClickMix

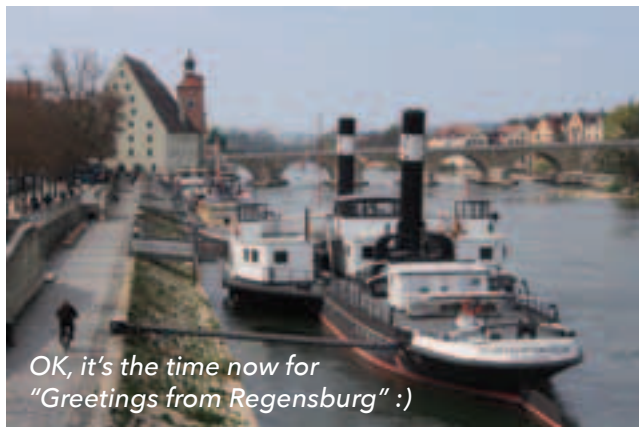
(or: what I clicked by my camera while riding that part)



*Like a magnet: it is sometimes hard to resist to become part of a field matrix.
Let's see what will sprout out of this seed...*



A lonely swan floats in the golden lace of a late afternoon. The last sweat of a tired sun turns everything into a magic cast.



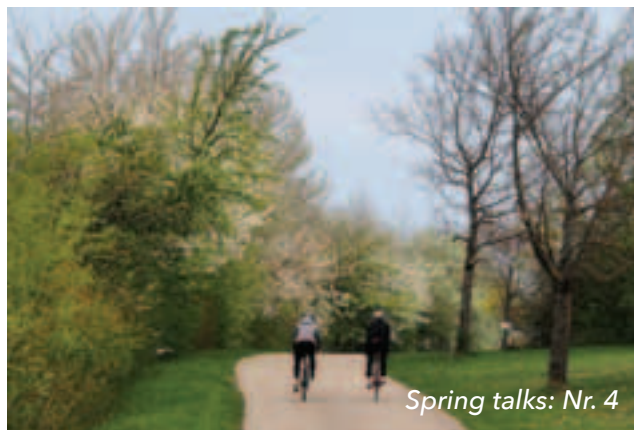
OK, it's the time now for "Greetings from Regensburg" :)



Spring talks: Nr. 3



Spring talks: Nr. 1



Spring talks: Nr. 4



Spring talks: Nr. 2

And now, a totally edifying fairy tale with a happy eco-ending:

He was an ugly Semperit Radial 165/70 R1481T M+S (Alpine proven).

She was an unsightly Hankook 145/70R13 71T M+S.

Then just a magic kiss of a bucksaw was enough to turn them into a beautiful swans.

And they happily lived in their garden ever after, while their offspring didn't carry any marks that would suggest the humble origin of the parents.





Slowly melting into the gloomy water, with a calm belief that a right wind will come one day.

And while we are at this impressive example of a cargo boat: completion of the Main-Danube system in 1992. (that also established a continuous link between the North sea and the Black sea) and connection of the Rheine-Main zone with the Danube, resulted in an app. 3500 km long water path. Germany has the longest river network in Europe (app. 7500 km) and water transport in the country amounts to 8 million tons per year - 20% of the local transport volume goes on water ways.

The carrying capacity of a typical barge is 1800 tons and that corresponds to 90 trucks: one fully loaded barge replaces a 7.5 km long truck line. With an equal energy consumption a barge will carry one ton of cargo 370 km, train will manage 300 km and truck only 100 km. Barges are economical and friendly to the environment.

20 centimeters bring 56 days

The importance of the Danube as a regional and trans-European waterway is stronger than ever. But it was not always easy to establish it - one example is the part between Straubing and Vilshofen. Before and after it the minimal depth of the river during low water level period is 2.5 m but on the Straubing-Vilshofen section such depth existed for only about 144 days a year: at the rest of the year it was just 1.6 m, which was not enough. After a reconstruction of the river bed, the low water depth was increased by only 20 cm, to 1.80 meters. But these 20 cm increased the number of practically usable days by 56 - to 200 per year.



A furtive view of the Würth castle



Another dam maintenance machine at work.

It was loud as sheep were somehow managing to chew and market their effort at the same time - the chorus was relentlessly shouting: "Yes! We do! The whole day! Trained for this! Yum! We are eco! We do! Yes! Yum!"



The machine operator. The easiness with which he managed to stay totally out of the present times was enchanting



A green landscape with some more former auto tires on it.



This nice modern ferry in Mariaposching actually looks like a part of some bridge.



In any case, there is a charming pebble beach there.



Flooded and thriving



A stylish rest point for cyclists and pedestrians.



And then, just like that: a splendid piece of an ad hoc art assembled by some unknown, talented hand. In this miniature Easter Island scene, the trinity watches the blue danubian distances.



A little mermaid waiting for ships at Straubing barrage



This rich choice after Metten depends on one's color preference: gray gravel on the left, white gravel at the waterside - or brownish dirt path on the top of the dam :)



The Danube banks in Germany and Austria are almost completely reinforced at least by packed stones. The first big regulation in this sense happened at the beginning of the 19th century, the next one with a similar scale came at the beginning of the 20th century. In the last two decades, serious reparations and upgrades were repeated after each of the big floods.



Approaching Windorf through an impressive triumphal gate. Don't know which distance this quantity of beer represents: all the way down to the Delta or this is just a minimum for an upstream ride to the source (of the Danube, not of the beer)?



No excuse for youngsters in this family - pedal all your stuff by yourself, young man!

Passau: on current with Ms. Christiane Kotz

It was in a sunny morning when I met my new cycling friends in small but charming Windorf, at the entrance of its island. And the Windorfer Donauinsel is quite a special one: it is the longest river island in Germany and is protected due to its special biodiversity.

Christiane was busy with last minute small things before the start of the 40 km long ride - the group was quite large. So I decided to skip asking something so weird and meaningless as "do they have Windorfs on computers there?" The mayor, Mr. Franz Langer, wished us a nice day and here we were - on our saddles, pedaling towards the distant Passau.



- We were collecting garbage and cleaning the area yesterday - said Christiane.

And when you are not cleaning, what do you do?


We are an administrative office responsible for the whole district. Our main duty is the nature protection, taking care that the urban development doesn't endanger it. We are also active with landscape design. There are three persons in our office responsible for these tasks.

What is your role in the DANUBE parksCONNECTED?

We take care mainly about work package 5 - dry habitats. But it is important to note that the steep slopes of the Danube in our area are very different from riparian forests in other parts along the river. The gorge that we have here between Hofkirchen to Aschach is almost 90 km long and the part we take care of is 50 km long. It is different habitat with different characteristics and different way it functions.



What the project brought to you?

Did it change  bit the way you are viewing your own experience?

Through the project we discovered we are not specific and that other similar areas along the Danube have same problems that we have. We are now well connected with the colleagues in other gorges downstream - Wachau in Germany, Duna-Ipoly in Hungary, Djerdap National park in Serbia and the Iron gates Nature protected area in Romania (opposite side from Djerdap). I personally visited Wachau, Duna-Ipoly and Djerdap.

We learned a lot about their experiences and difficulties they face. We see what they do and we also share our experience with them: the Danube water doesn't know borders and we should look at things the same way. It is also necessary to open the eyes of politicians, to help them to really adopt the fact that some problems can't be solved within one country - what is needed is an international approach.

One important result that we produced in the frame of this project and through joint work with others was a dry habitats map of the complete Danube. It was big task and huge challenge because different countries had different quantities and qualities of available data, used different systems to gather record the data and different formats to view them. We took what was available and our IT experts managed to synchronize the data and to turn it into an universally readable and available database. For some countries working on this map was also a great push forward: they established systems of data gathering and processing, and they will serve many future purposes.

What would be a result of your work that gives you the strongest feeling of personal pride?

We accomplished two projects with Upper Austria region comprising rivers Danube and Inn. Through this projects we (the district) were able to actually buy 60 hectares of land on the Danube slopes and 25 hectares in the Inn riparian forests. We use that land now to design different landscape and habitat approaches, and to demonstrate to others what a good approach policy should be and what advantages it brings. Based on this we were also able to convince politicians and other authorities to assign more money to protect nature in the district and to support our work.

Is there any resistance?

Not if we speak of steep slopes which are not attractive for development, construction etc. But in other areas there is sometimes friction when it comes to preventing people from building objects or from using land on a harmful way. Fortunately there are much more nice moments like our ride today and such things give a us a full satisfaction :)

At the end: how does it come that you know almost every small side path that we pass?

Well, I am in the office since 1985.

But there are many people who work on similar jobs and they don't seem to know all trails and hidden corners of an area they are supposed to take care of?

I am an enthusiast at the first place so I spend a lot of time in nature – smiles Christiane.

The Danube stretch from Passau to Jochenstein is one of Germany's most important and most protected areas. The steep valley slopes are since 1986. a nature reserve and since 2003. they are included in Europe-wide important system "Natura 2000 Protected Area" (Fauna-Flora-Habitat area).

The most valuable element in the zone is the unique reptile fauna. There are seven species of reptiles, including the largest and most beautiful reptiles of Germany: the green lizard and the aesculapian snake.

However, the nature reserve is also very rich in other species and a valuable refuge for butterflies, beetles, wild bees and many other animal groups. It is home to a diverse flora and a fascinating variety of mushrooms. Already extinct species were rediscovered in these valley slopes again and even completely new species for the whole Bavaria and Germany.



The uniqueness of the area is the result of several factors: at the first place the Danube as the European migratory axis, and responsible for the exchange of animal and plant species between East and West. Secondly, southern exposed slopes of the narrow, deep valley are also in contact with the zone of the Bavarian forests. As a result, very different sites are created with communities that are very special combination of different regions of Europe.

And we reached the Jochenstein power plant and the House Am Strom - the final point of our cycling program.

But it was not the end yet: we boarded a bus that took us high above Danube, then walked to the view point Ebenstein (513 m above sea level)

The DANUBEPARKS and the cooperation of the "Danube Canyons"

The Danube is a green line for biodiversity and its protected areas preserve the most valuable sites - they are crucial zones for the long-term preservation of the rich biodiversity and natural heritage.

DANUBEPARKS - The Danube River network of Protected Areas - has been working for 10 years now on a harmonized and unified approach for nature conservation along the Danube. The Danube Canyons are its long time important partners within this network.

Danube canyons stand for the need of cross-border cooperation and sharing experience and activities between countries and regions - they should not stand for separation but cooperation.

The intention to share the know-how and good practice resulted in a shared project activity in the frame of DANUBEPARKS CONNECTED - a Danube-wide project on the field of ecological networks, co-funded by the EU Interreg Danube Transnational Programme.

The "Haus am Strom"

The environmental station Haus am Strom is positioned right at the left end of the Jochenstein dam. Its name is a little play of words: „strom“ means river current but also an electrical current.

The station is organized as a non-profit GmbH and is recognized by the Ministry of the Environment as an environmental station.

- Our central task is environmental education: sensitizing and motivating visitors to deal with the environment and nature with care - says Raymond Kneidinger, the managing Director and Deputy District Administrator in the district of Passau.

But what we as a visitors should know is that the House is full of genial ways to teach and illustrate processes in the nature and the way humans influence them. So visit is a must.



Even the elevator here is unique: it is the only one in the world that works on river water - more or less the same way the typical lock work when transporting ships from one side of the dam to the other. Some of my other favorites:

Pump the water to see the height of a catastrophic flood. But the text at this model says something really worth thinking about:

"Chaos, catastrophe, deluge, sinking... That's how man expresses this natural happening. These words reflect our perception of the destructive power of a big flood. But the Nature has learned to live with these "catastrophes" - communities of rivers and floodplains are vital enough to survive such processes of purification and renewal in the great cycle of becoming and passing away. We can learn from the Nature how to deal with these elemental forces without being exposed to their destructive side. The most important step is "a step back ": to give the river more space again - in its very own area."

Answer questions in this quiz about saving home energy by putting the plug into the right socket.

Here you can turn the wheel to see the consequences of using water for your needs.

For the everyday things like showers, washing, cleaning, cooking and toilet we already consume almost 125 liters of water every day. But even more striking is our "hidden" consumption - the water used to produce our consumer goods. When taking this into account, the consumption amounts to an unbelievable sum of 4000-5000 liters per day for every German consumer.

See a great short movie showing how the Danube became Danube.

And check would you be able to leisurely walk through the space occupied today by Passau or Vienna...

Maybe the best game of the exhibition: this is a plate with holes representing dangers that certain species encounter on their migratory way.

This one is about fish: move and incline the plate trying to bring the ball (a fish) to the Passau protected zone, passing holes marked as "illegal fishing", "sea pollution", "toxic wastewater" and others.


Even the toilet is a chance to learn something... The theme here is of course waste water processing in a sewage treatment plant.



A very sedimental talk with Mr. Gerald Zauner. Plus: an ecological fairy-tale that turned to reality.

Next day after Hause am Strom I returned to Engelhartzell to meet a person recommended by Christiane and I was really happy that I did that: during the talk with a fish ecologist DI Dr. Gerald Zauner I was probably barely blinking my eyes - that interesting was what he had to say.

After working on University Vienna for 20 years he decided to take advanced control of his dreams and initiatives. In his birthplace, Engelhartzell, he established the company ezb / TB Zauner GmbH that specialized in working on and revitalization of big rivers like the Danube or Inn. They make concepts to improve the ecological situation, then suggest solutions to the state, local governments and power plants, helping the country to meet guidelines from the "EU water framework" - a document that defines related obligations for the EU members.

What is it that  makes you most satisfied after all this time?

Back in the 80s we started the first project and research in Engelhartzell. It has been a long journey now, long enough to see and confirm the good results.

One result of our work is a lot of side arms in the Wachau area - what one can see today while watching the Google Earth images is actually a continuous 30 km long zone there completely changed by measurements in the past..

Several years long construction of a fish passage Aschack-Wilhering ended in 2016. With the length of 14.2 km it is the longest in the EU and might be the longest in the world as well.



With one Autochthonous Acipenser ruthenus (Danube sturgeon) from Engelhartzell (photo G. Zauner).

But there is still a lot more to do?

Habitat situation of the Danube is not good. It is a highly regulated river and mostly not a free-flowing one. In Austria there are only two free-flowing sections: 50 km long Wachau part (30 km from power plant Melk and 20 km more from Krems) and 50 km long part east of Vienna (.e. where the last power plant in Austria is).

At Jochenstein power plant (where the Haus am Strom is) the height difference between upstream and downstream side is ten meters. And there are ten other power plants along the Danube in Austria.

Then the huge Gabčíkovo dam in Slovakia influences the flow for almost 60 km upstream - all the way to the mouth of Morava River, 10 km before Bratislava.

So Danube's slavery in a glance looks like this:

- Austria has 10 power plants;
- Then there is Gabčíkovo dam in Slovakia;
- Then there are power plants Iron Gate 1 and 2, shared between Serbia and Romania.

It is interesting that Hungary does not have any power plants on the Danube. They almost finished one in 90s but then abandoned it due to strong public opposition and maybe also due to lack of funds (Hungary wasn't an EU member at that time).

What about Germany?

Some small power plants, but it is also a small and kind of different river there too... The Danube before Passau by its characteristics (temperature, flora,..) actually looks more like the Inn. This is understandable if we now that the Danube discharge before the Inn entrance is 600 m³/sec. The discharge of the Inn is 770 m³/sec. That's how the Danube comes to a discharge of 1450 m³/sec. (Later in Vienna it will get to 1920 m³/sec.)

At this point we could get into doubt about which is the main river and which is a tributary here. But although the Inn has a greater average flow than the Danube when they converge in Passau, the Danube has a greater length, drains a larger surface area and has a more consistent flow - that is why the Inn is considered a tributary of the Danube and not the opposite. (The Inn is thus the only river originating in Switzerland that ends in the Black Sea - via the Danube.)

How do we determine start and end of a free-flowing section?

The starting point is where the influence of an upstream impoundment ends. That would be a place where the river water is back to its natural level, the one it would have if there was no impoundment. And end of a free-flowing section is off course at the next power plant downstream.

How and when the Danube in Austria got captured that much and turned to... a slave?

Power plant Jochenstein was the first one that was built. It was after WW II, from 1952. to 1956. Four years later came next one, then even more of them - ten in total. The last one was built in Vienna in 1995.

Are there consequences? A revenge of the tied river? To discover that we should first learn something about the stuff that the Danube chews all the time.

There are two types of sediment: the fine sediment - mostly fine sand - comes mainly from glaciers in the Alps: they grind and mill rocks and stones into fine particles, plus the Alpine rivers have big fall and speed. Thirty milligrams per liter is how much of it is transported from the Alps now, with a total of 4 million m³ per year. But in the past, it didn't stay...

Today, Jochenstein is the first power plant on the way and it stops most of the fine sediment. It is actually being deposited in the upper flow of the river all the time from 1965, and the total quantity is estimated to be - 25 million m³.

The first solution to get rid of it was to dig it and to deposit it on the banks - but that off course was a dead end. During big floods and extreme high flows, these deposits are flushed away: we once lost 8 million m³ during just one flood. This material ends on arable, cultivable land, in layers that can be up to 1-2 m thick.

And then?

And then you bring machines and perform a gigantic task of removing that stuff from fields, to make them usable again.

There is one more type of the sediment...

The original **rough** sediment of the Danube is a **pebble** with size of a fist. It used to come from tributaries, mostly from Inn, and in the past the Danube transported app. 400,000 m³ of that type per year. But the Inn is also totally impounded today (there are five pow-

er plants there now) and other important tributaries have similar destiny - so the pebble supply stopped. At the same time the Danube dynamics is the same as it always was: especially in free-flowing areas, water speed (i.e, energy) is high and it moves downstream the pebble that is still in the bed. But today there is no compensation for that transported material and the consequence is that the river is actually digging itself into its bed. So the water level sinks - typically 1-2 cm per year.

You mentioned a specter of unexpected problems that come to existence since the river got heavily impounded. Can you illustrate some of them?


An interesting phenomenon, for example, is that during extreme flooding the pebble in the Aschach impoundment has been transported from the upper to the middle part. (The water energy is not high enough to move it more towards the end of the impoundment.) That deposit was pushing the water level above the allowed limit and that's why twice so far - in 2011. and again in 2017. - it had to be excavated (all together 750,000 m³), and moved... back to the upper part. Expenses were covered by the power plant.

An interesting game it is... Is there more?

The sedimentation is a constant process in the Danube flow, but once that sediment gets into riparian forests as well (typically during high water levels) the river is not strong enough to later flush it out of the forests.

Sedimentation without transportation - that brings problems. Especially after Vienna, the soil becomes higher and higher after every flooding. But the original forest habitat there is characterized by a small level difference between soil and water, while typical plants have shallow roots. When that difference starts to increase the original plants disappear and get replaced by new, untypical ones.

And then, almost at the end of the conversation and almost by chance, this jumped out and delighted me the most: an ecological fairy-tale that became reality.

In 2011  the company was about to fill up parts of the Linz harbor to increase its useful area. The operation was planned to last until 2013. But Gerald had a concept to propose to the Upper Austria government: the contractor should provide some kind of compensation for the area of the river he will turn into the land.

The idea came from old maps showing a jagged coastline at a certain zone upstream from Linz instead of the simple, continuous present-day banks reinforced by stones. The contractor should make a sidearm and an island, converting the area into the former state.

The company fiercely opposed the concept, stating that it would make expenses much higher. At the same time, they planned to buy filling material somewhere else and to transport it to the harbor by 20.000 truck rides (through the heavy Linz traffic): the Danube didn't exist in their plans at all, except as "the water in the harbor".

But by using the excavated material from island/sidearm area (and that material was not only free but also of higher quality comparing to the one they planned to buy) and transporting it by river to the harbor, the project price actually got - lower than projected.

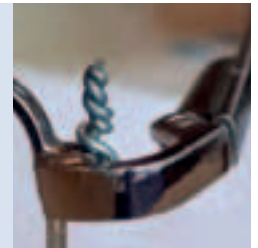
At the same time the Danube got better bank configuration: the terrain was lowered by 5 m on an area of 16 hectares to make the island (its top is 3m lower than the landscape before) and by 10 m to make the sidearm.



The map shows filled up zones in the Linz harbor (red) and the new island (green)

And they all lived happily after all. While the story shows that, at least sometimes, business/development and ecology can be reconciled. Thank you Mr. Zauner.:)

PS
If you ask me, Gerald can be also proud of how he fixed my glasses while we were talking the Danube stuff. I even noted that with this small antenna, Wi-Fi reception of my phone improved by 18%.



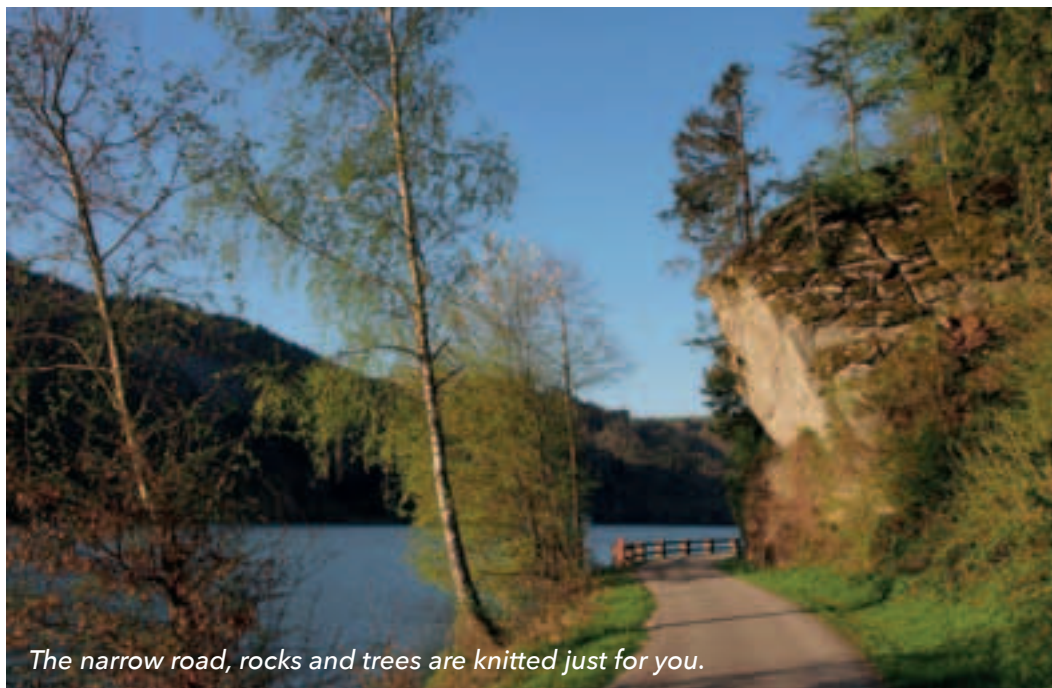
ClickMix: Jochenstein - Linz

I come from a country where we at first could travel the world without a visa, like almost no one else. And then there was a time when we couldn't travel anywhere without (hard to get) visa. So I learned to appreciate every crossing of a border, even if it was as symbolic as this one. It is beautiful - and important - to cross borders easily as if they do not exist. It is a natural right that we acquire by birth and that we carry through our whole life - regardless of whether others respect it or not. It is part of our dignity, the measure of our humanity. And where it could feel stronger than along a mighty river that just flows and flows, minds its own business and does not care about human passion for invisible lines? I want to flow like that. But instead of diverging in a sea, after passing this board I will feel a bit more compact, a bit more human :)





*Take care: never, ever be boring. Even when packing firewood.
(Most people fail right on this task.)*



The narrow road, rocks and trees are knitted just for you.



Being just plain beautiful, no other plans or ambitions



Linz: leveled by long shadows

ClickMix: Linz - Melk



Swans feeding humans



This vain facade of the chalet Wedl in the town of Mauthausen demands passionate attention from passers-by.



This landscape is, however, modest. A silent green field. Only two hesitant trees (is it spring, should we bloom? is it autumn, should we let the leaves go? or should we do both?). A road that barely dares to swerve. Perfection in minimalism.

Love, but without kisses

Both in Germany and Austria the Danube towns hide behind walls again. The difference to medieval times is that the modern concrete walls do not protect from armies or robbers: it is the beloved and sung river who nowadays ends on the top of the unwanted visitors list. In other words: we love you but stay where you are.

Fortified cities: as it was always the case, they can close their entrances as fast as a snail pulling into his house



In front of the Pragstein castle (Mauthausen) only metal plates disclose that it is not just an ordinary cycling path: if necessary, a wall will appear here in no time.

Towns and villages sometimes almost seem to compete who will better present big floods.



And Melk's "flood display" certainly belongs to more original ones: As the top plate shows, the biggest recorded flood happened in 1501.

Machland dam

The largest flood protection project of Austria started after the flood catastrophe in 2002. It was finished in 2012, with the total cost of around 183 million eur. At a length of 36 km, the Machland dam protects 1000 houses and more than 22,000 inhabitants between Mauthausen and St. Nikola an der Donau. In addition to dams and mobile protective elements, the system also includes an about 9 km long flood basin (a "safety valve" which is only flowed through at large flood).

Why all this caution and suspicion? One answer is for example the blue mark above, showing water level during the flood of 2002. in Austrian town Labing.

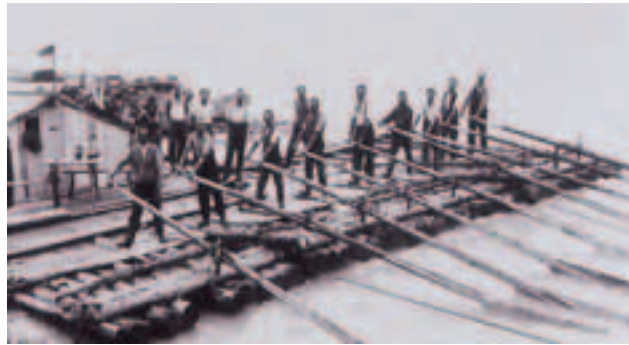
The only flood here has white color



A forest bewitched by mistletoe.

Rafting on the Danube?

In small town Au I saw info boards with old photos like these:



Rafting on the Danube actually had glorious past that started in 1774, when forestry engineer Josef Rosenauer came to an idea to transport wood from the Bohemian Forest to Vienna (the capital was rapidly growing at that time and firewood was always scarce) via Große Mühl, an orographic left tributary of the Danube, and then Danube itself.

Here in Au was one big rafting harbor, but the goal of these rafters was mainly Csepel island in Budapest or "Weana" wood depot. The total amount of transported wood was 40-60.000 cubic meters per year. Rafts were often made in just one day and were appropriately called "Pesters" or "Weana". One "Pester" contained about 600 cubic meters of wood, was 65 m long and 15 m wide, and had a hut that could accommodate crew of 10-12 people. Together with a huge travelling "island" of wood that it was controlling, it would reach Csepel in 5 days if everything was fine.

Rafting lasted more than 140 years and ended in the forties of the last century, when it lost pace with modern means of transportation.



Plowing shadows



The geometry of a sunset.



Yes, cycling is beautiful



A surprise: the mysterious Ötscher Mountain nonchalantly walks its snows across the view



The panorama of Grein



The panorama of Struden



Through the lock



*Approaching Melk.
From the opposite bank it looks like just a large forest with the abbey as the only man-made structure.*



Benedictine abbey (Stift) Melk sits on a hill overlooking the town and the river since 1089, but was destroyed in fire in 1297. The building that we see today is an 18th century rebuild in the Baroque style. The abbey is a UNESCO World Heritage Site, famous for its frescoes and library

Protected area of the Wachau valley

The name "Wachau" sounds big and deep - with its right mix of vowels and consonants it resonates far and wide. But it actually marks a short, 16 kilometer long stretch of the Danube located midway between the towns of Melk and Krems: from Spitz to Loiben on the left bank, and from Oberarnsdorf to Mautern on the right one. It is one of the most prominent tourist destinations of Lower Austria. The touristic formula of Wachau is simple and clear but hard to beat: picturesque landscape + historic villages + wine making tradition.

Inscribed as "Wachau Cultural Landscape" due to its architectural and agricultural history, due to its vineyard walls, architecture, the Krems monastery... the region is on the UNESCO List of World Heritage Sites since year of 2000. The area was inhabited even during the Upper Paleolithic or "Old Stone Age". The famous „Venus of Willendorf" figure, discovered on the banks of the Danube, was carved some 25,000 years ago, and represents one of the earliest images of the body made by human hand.

And Wachau also means slopes. Steep ones. Here the mountains rise right above the Danube, forming a narrow valley between Krems and Melk. Steepness is a character determining feature of the relief, steepness permeate the way of life. Vineyards of Wachau are steep ones. Pastures are steep. Paths are steep. Even people of Wachau are steep. (What steep? They are completely vertical :)

What is important to bear in mind in order to understand the great nature conservation significance of the Wachau? It is the coexistence of river landscape, dry grasslands (or "burnings" as mentioned in the previous reports - or "Brennen" in German), hillside

meadows, natural forests, vine terraces and orchards. Geological, climatic and landscape diversity is reflected in a species-rich flora and fauna. The different habitats are refuges for 300 plant species - among them 30 different types of orchids. Rare species of birds such as peregrine falcon, black stork, eagle owl, kingfisher and hoopoe can be seen, sea eagles are regular guests. Then there are beavers, 47 species of grasshoppers and emerald lizard - the heraldic animal of the Wachau - which inhabits traditional dry stone walls of the vineyards.

Let's add to this that the Danube flows free on this stretch - there is no influence of power plant dams here. There are numerous gravel islands and banks and such structures, together with the old and revitalized arms/tributaries, promote the rich fish population with over 50 species. Remains of natural floodplains with flat riparian forests with softwood parts of white willow trees and precious (endangered throughout Europe) black poplars, accommodate more than 50 species of birds, rare bats and dead-wood beetles.



No, bicycle was not of use here.

And no bicycle tool was of use here either - I got instead a pair of big cutters like these on the photos.

Touching carefully all the legacy and balancing its role and place in this touristy and wine micro universe, a team from LEADER-Region Wachau-Dunkelsteinerwald office covers a wide range of experience and specialist areas for the manifold tasks of regional cooperation. They will be my hosts today and I met them in front of their space located in the castle above idyllic tiny town-village Spitz: Mag. Hannes Seehofer is an project manager of nature conservation who works in the office since 2003, and Dlin Elisa Besenbäck is here since 2016.

There is also a whole nice group of local nature lovers that will do some useful work on one of the protected burnings. But as this is an area of steep Danube slopes, we will have to go high above the river to find one - that was different from my previous visits to burnings in Germany and Austria.

"In other zones there is usually one type of protection. But this region is not only about the nature - it is an indivisible combination of nature and man-made cultural landscape. That's why it is protected on several ways: as an UNESCO world heritage, as an Natura 2000 area, while it is also recognized by its European Diploma for Protected landscapes" - says Mr. Kurt Farasin, an enthusiastic member of our group but also an Artistic Director of Schallaburg & Lower Austrian National exhibitions.

That is also why this is not a classic national park, despite the fact that since its foundation in 1990, nature and landscape conservation have a special significance in the region. The Wachau became a nature reserve in 1955, has been awarded the European Nature Conservation Diploma by the Council of Europe since 1994, and has been recognized as a UNESCO World Heritage Site since 2000. In 1972, the area around Jauerling was designated as Jauerling-Wachau Nature Park. The Wachau is part of the Europe-wide network of protected areas Natura 2000 (Fauna-Flora Conservation Area, Bird Sanctuary).

Kurt announced to me that next year (2020.) the Schallaburg castle will host a large exhibition with the Danube as a subject, but from a very specific view: it will show stories and items gathered during one long journey from the Delta upstream to Austria and Germany.

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The maintenance and care of species-rich burnings and meadows is a major challenge for nature conservation. The Höhereck near Dürnstein is the largest burning in the eastern Wachau with 200 different plants and about 100 species of butterflies. Typical for the Wachau dry grass areas are the feather grass (stone feather) and the large and the black cowbell. On the plateau of Jauerling and in its side valleys there are remnants of original lean orchid meadows.

We are hiding to Protected area Setzberg that has an area of 10 ha, from which 6 ha is an open (clear) space. The burning is a natural monument.

The microclimate in the area is a mixture of continental and Pannonian climate. And similar situation is with plants, except that during thousands of years even plants from Asia have found its way to here. The average rainfall is modest 300-400 mm per year, while Krems is one of the driest places in Austria. (Only 40 km away in direct line are the Alps, with about 1000 mm of rainfall per year.)

The soil is composed of limestone, silicate and marble granite. "Dunkelstein" or "dark stone" has a magmatic origin as a mix of volcano ashes which got pressed in the sea bed. (Grey "clouds" in the white marble are actually the volcanic ash.) During long geological periods it was at least three times pushed to surface and sank back under the sea bed, meaning that it withstood three cycles of cooling down and heating before it became what we see today.

This hilly zone was populated in the past but, as many similar ones, was abandoned after WW II: in that period the development of industrial agriculture led to drop of products prices and small farms were not able to keep with that pace. One such farm couldn't support its family anymore, so someone had to get other job - and it started migration to cities.

The good consequence is that, since there is no more agriculture here, the whole region is a middle fertilized one. Why it is not completely free from fertilizers? "Because they still come by air", says Kurt.

Fighting against invasive plants the way we do it today, on an area as big as Setzberg, off course wouldn't have chance in long term. (Especially with someone like me in the band: while clicking and cutting around I thought of a possibility that it might end by being informed that I just cut the last remaining specimen of some region's trademark plant :) That is why the Spitz team since 2010, used to organize 1-3 international summer work camps that gathered 10-15 participants from Europe, South America and Asia. During two weeks of work in the camp volunteers support the protected areas primarily in dry grass care and in the fight against neophytes, with the help of motor cutters or local farmers' mechanization.

"We now cooperate with other national parks like Donau-Auen and Thayatal at Chusel border" - says Elisa - "and share these two weeks with them. We also



Despite being clearly marked as a nature monument, this steep part of the burning is sometimes used by... mountain bikers who find it suitable for downhill ride.

organize another working camp with world heritage issues in cooperation with the Upper Middle-Rhine valley. It is a constant fight: we look for all possible partners and ways to enable financing of the camps." After doing the job at Setzberg we started descend to Spitz but using different path. And here we were - the vineyard terraces, the core and hart of what made the viticulture of the region extreme but at the same time possible, determining it as the Cultural Landscape. A special feature is the fact that the walls are of the "dry" type: they were made without plaster, just by skillful stacking of stones. It all started at the beginning of the 10th century when monasteries started to cultivate vines not only on the valley floor but also on the steep slopes, by forming them into this impressive landscape.

Some incredible data about what I could saw around me:

- visible dry stone wall surface area is ca 2 million square meters;
- total length of dry stone walls is ca 720 km.

The walls accumulate heat during the day and then during the night slowly release it in the sandy soils - something that vine likes a lot. It is necessary to continuously maintain them, while there are no many people nowadays who know how to do this ancient craft. But as it is now a cultural heritage the interest is growing and there are even regular courses for those who are interested in learning the skill.

The steep terrain requires much more labor than in vineyards on the plain as there are very few opportunities for mechanization. But even in the places where machines could be used they are deliberately omitted and work is still mostly done by hand (all Vinea winemakers are even obliged to hand harvest). Many wine growers are living on their farms which were built centuries ago, and much in the Wachau remains the same as it was in the far past, despite the pressure of modern times.



The stone terraces and apricot gardens line the imposing side valley Spitzer Graben ("steep slopes"). The highest vineyards of the Wachau are located here, 450 m above village Mühlendorf. And result of the comparison is not bad at all, especially having in mind that the Banaue rice terraces are considered to be the Eighth Wonder of the World :)

"Some 10.000 years ago the Danube actually flowed through the Spitzer Graben" - explains Kurt - "At some places you can still find river pebbles as a proof to that."

And it is not all about the wine. Using of concrete in the process of construction would reduce ecological functionality of the walls, but dry-walls are valuable, friendlier place for living things. That morning, when I asked how many different habitats are around here, my hosts said: "countless". And now I understood why: the small cluster that can be seen on the photos below, consisting of couple

meters of wall, a tree, some vine and some other plants - is just one of many islands in the sea of vineyards around me.

Each of these islands accommodate a variety of animal and plant species including even the Aesculapian snake, the largest native snake species in Austria.

Then Elisa, Hannes and me cycled to Krems. We first used ferry to cross to the right bank of the Danube. The ferry had unique feature: a Camera obscura installed as a part of an artistic project. Two huge simple lenses (shown by the arrow below) captured images of the surrounding space and sent them through a simple prism to the dark room where one could watch them on two simple optical screens. Despite the simple question "why should I sit here instead of simply going outside to watch the original", there was that simple, inexplicable magic of the pinhole cinematic effect that kept me inside for the whole ride... Ok, the simple coldness outside had a little bit to do with that as well :)

While we approach the point where Rührsdorf side arm departs from the Danube, Hannes talks about its importance: "Our reason to be proud would be at the first place ten kilometers of side arms constructed or revitalized in last ten years through the 'Life' project funded by the EU. Here we implemented very important water measures in Rossatz-Rührsdorf area."

„There was an alluvial forest there and we want to have it back, mostly because of fish – the water will be calmer and more convenient for their reproduction, spawn, etc.“

Private land owners are an important part of such plans and most of them are open for cooperation, but it doesn't always go without glitches. The planned new side arm is one example of that: "Beavers recently damaged one orchard and fresh image of his damaged property makes the land owner worried that the new sidearm would bring even more of them. That's why he opposes the project at this moment and we will need some time and some good arguments to change his mind."

Hannes states that the ecological awareness in the region is high: "There was plan in seventies to build a new dam between Dürnstein and Rossatzbach. But



This info board shows what was done and what is planned in the system. On the map below:

- Blue color - already finished side arm;
- Yellow color - planned new side arm;
- Green hatched zone - planned nature reserve with eagles, amphibians and black poplar.

strong public reaction prevented it, and this movement actually become the base for world heritage and the rest of the story here."

But he also adds this note: "Local people pay more attention to more visible aspects of the values we have here – and that's mainly terraces. Less respect is given for subtler things like burnings. It also depends of the interests: hunters support us to maintain burnings because they love open spaces. On the other hand, rock climbers often disturb the rare Falcon Peregrine who makes its nests in rocks and cliffs."

Within the frame of the DANUBEparksCONNECTED in last three years Elisa and Hannes visited Donau-Auen and Duna-Ipoly National parks; Elisa had the opportunity to also see Kopački rit, Rusenski lom and Djerdap, while Hannes visited Prut and Persina. Elisa thus has good ground to conclude this: "Important thing that we learned through the project is that the challenges are similar. There are different ways to approach them, but there is no need to invent the wheel again and again - we can learn a lot from the experience of others."

Donau-Auen National Park:

On a pleasant sunny Vienna morning, we gathered in front of the Donau Insel Info center: a nice cycling group consisting of the Donau-Auen National Park partners from different projects.

We didn't have to move far in order to learn about the first project, MEASURES - managing and restoring aquatic ecological corridors for migratory fish species in the Danube river basin and the LIFE Sterlet Project. There was a container in the yard of the Info center that wasn't attracting much attention until we were invited inside by Thomas Friedrich, Project Manager of the LIFE Sterlet project. Then we saw that another container was attached at the back, and the "2001: A Space Odyssey" movie protagonist David Bowman would probably say here: „The thing is hollow -- it goes on forever -- and -- oh my God! -- it's full of... sturgeons!“

There were thousands of them actually, but most were not much larger than a fingernail: we actually entered a big incubator. „And these are quite exhausting little creatures“, said Thomas, „They must be fed every hour, 24 times a day, otherwise they would start to eat each other.“

The air in the containers was packed with other interesting small talks. In order to prepare sturgeons for later "real life" they breed in the Danube water that is not processed in any way. Or: to find DNA traces of fish that are already in the river, they "sniff" it by taking 40 liter water samples, then search them for traces of skin, scales, and mucus. It sounds like

looking for a needle in a haystack but in reality it is more like, um... looking for a needle in a haystack. Well, in order to be an expert in any field one needs commitment, but also a good deal of faith in a good outcome.

The youngsters will be finally released into the Danube, with best wishes for their good luck. They will need it, especially females - on top of other danger they will have to face, some humans who will try to "pickpocket" something they will carry along one day: their eggs. One kilogram of caviar is 10-20.000 EUR worth and that is a bit too much of a temptation to the honesty of some. Despite the ban on fishing of sturgeons, they will try to earn that money.

On the second stop we heard Marlene Haimann's (University of Natural Resources and Life Sciences, Vienna) report on the Danube Sediment project. As a counter measure to negative results of human activities in the past 60-70 years, 14 partners from nine countries target the restoration of the water/sediment balance in the river as well as an improvement of its morphology. A main project result will be the first "Danube Sediment Management Guidance" as a key contribution to the river's mayor management plans - one for its basin and the other that deals with flood risk.

Next stop: Magdalena Wagner from WWF tells us about the project coopMDD . A Transboundary Management for Mura, Drava and Danube - the "Amazon



A teenage sturgeon



of Europe" which goal is to protect nature in a highly valuable, free-flowing, 700 km long river corridor that comprises almost 1.000.000 hectares across Austria, Slovenia, Croatia, Hungary and Serbia.

Magdalena also presented the Amazon of Europe Bike Trail project which aims to establish an internationally recognized and sustainable flagship Cycling Tourism Product in the future 5-country UNESCO Biosphere Reserve Mura-Drava-Danube.

Agnes Kurzweil from the Austrian Environment Agency presented the Transdanube.Pearls project which aims to develop socially fair, economically viable, environmentally friendly and health promoting mobility services for the visitors of the Danube region.

Sabrina Scheuer (University of Natural Resources and Life Sciences, Vienna) introduced us to the project Danube Floodplain - reducing the flood risk through floodplain restoration along the river and its tributaries, and at the same time maximizing benefits for biodiversity conservation. Interesting aspect of the project is also a combination of classic and green infrastructure. And they managed to form an amazing network of no less than 25 partners along the Danube :)

On the next stop we learned from Christoph Litschauer (Donau-Auen National Park) about the Alpine Carpathian River Corridor project. The goal of this three-year long Austrian-Slovakian cooperation involving seven partner organizations is to protect, restore and develop river biotope connections in the mentioned space. Success will be monitored with flagship species like kingfisher or dice snake.

The Danube STREAM project is about smart, integrated and harmonized transnational waterway management and involves partners from Austria, Slovakia, Hungary and Croatia. Gert-Jan Muilerman



„We also have our dry habitat here - it is our dam and it gives us these beautiful orchids”, says Georg.

(viadonau) emphasized that its objective is to establish and maintain an efficient and environmentally-friendly transportation network. Among other things it provided navigational maps for ships passing nature wise sensitive areas of the river, as well as user-oriented information services. The project also embeds innovative elements, futuristic technologies and services - i.e. inland waterway infrastructure improvement pilots. And I liked its moto: „Common river. Common goal.”


The project Plastic free Danube project considers the stretch from Vienna up to the hydropower plant Gabčíkovo in Slovakia”, said Iris Kempter (viadonau). “And it focuses on macro plastic waste (bigger than 5 mm) in and along the river and parts of its riparian area. The overall aim of the project is to establish a knowledge base as well as a methodological approach on plastic waste - entrance points, quantities, transport patterns, and environmental threats.” A big plastic bag magically appeared in Iris’ hands, and



we could see a collection of assorted real examples. There were parts of toilets but even one tennis racket in pretty good condition.

We finally made it to schlossORTH National Park Centre of the Donau-Auen National Park

The beluga sturgeon (Huso huso) is the most powerful representative of the Danube sturgeons - it can be up to nine meters long. This giant used once to migrate from the Black sea as far upstream as to Ulm but today the Danube dams block its path. The model in SchlossORTH was made in Romania and another copy is located in Tulcea, the gateway to the Danube Delta - looking forward to see it there.

The second day of  visit was reserved for a tour with the office staff. Here we are at the start, in front of the Eckartsau castle. Ms. Stephanie Blutaumüller was paving my road all the time by contacting partners, opening doors and making my visits possible. Without her I would have been lost and could have easily been somewhere on the Volga at this moment.

I got a present from Georg: a feather from the tail of one of these magnificent creatures. It was for the good luck but also had a deeper meaning, like with American Indians. So it was an important and valuable gift. But it is hard to find good spot for such a fragile thing on a long-distance bicycle. I proudly put it on my helmet - only to lose it from there just several days later. Sorry Georg!

With Georg Frank speaking

The south wind that was bothering me quite a lot since the beginning of the journey, slowly gave way to the western one. It was nice to finally have such help at the back, but Georg said: "That south wind was protecting from bad weather from Atlantic ocean. So expect some rain along your route now".

I got quite irritated by such a naughty prediction. Don't tell me such things. Instead, tell me for example absolutely everything that you know about the Donau-Auen National Park. And that's how the interview started (the rest is a history).

"The park covers an area of almost 10.000 ha. Forest and water areas - 75% of the total Donau-Auen surface - are excluded from commercial use", started Georg.

Let me say here that the time spent with experts during this journey changed my view of many things, even small ones. I can for example admit that last year, while I was happily cycling the same route but for different reason - doing a survey of the EuroVelo 6 route - the park's name didn't light a bulb in my head. This time I paid attention: "auen" are meadows, pastures but also - the most appropriate meaning in this case - wetlands, floodplains.

The Donau-Auen National Park is a green stripe that proudly connects Vienna and Bratislava. The document that established the NP in 1996. even foresees future expansion that will include all wetlands between these two cities.

This national park protects the Danube and its islands, forests, meadows and bordering wetlands. It nicely floats on a zone that is challenging and a bit turbulent: the alpine part of the Danube with its waters that can vary by as much as seven meters, reconciles here with the part that leniently wanders deep into the Pannonian plain. Resulting rich habitat abounds in species:

- over 800 vascular plants;
- over 30 mammal, 100 breeding bird and around 60 fish species;
- thousands of different insects, fungi, microorganisms and algae.

When we talk about DANUBEPARKS, the main results and success are obvious, but is there something more subtle that makes you particularly happy?

In a questionnaire that we distributed to all partners couple of months after the first DANUBEPARKS project was launched, one of questions was "what do you foresee as the main difficulty in the project"? Seventy five percent of the partners answered that it will be the different languages and cultures. Then the same questionnaire was sent when we were already 6-7 years deep into the project, and this time the opinion was that the different cultures were the main advantage of the project :)

Another great challenge along the Danube is the fact that the richest and the poorest countries of Europe share that same water line (*) But who is rich and who is poor? When it comes to the natural wealth things turn to their opposite: materially rich countries destroyed their nature and reduced it to small reserves like Donau-Auen National Park. Here then, there is an embedded discrepancy: you build your standard by destroying your nature. Economy development or nature conservation? That is the challenge: how to bring commercial development to materially poorer Danube countries without repeating that same mistakes there.



Devin - passing the forbidden gate

Our Donau-Auen group was still together when we reached the border between Austria and Slovakia. Right on the attractive pedestrian-cycling bridge over Morava river we met our Slovakian host Ms. Andrea Froncová, project manager from BROZ organization.

For a man from former Yugoslavia, "Broz" immediately blinks a very special lamp. But Andrea for some reason didn't want to admit that the organization has anything to do with Josip Broz Tito: "We are Bratislava Regional association for nature conservation and sustainable development, in Slovakian 'Bratislavské Regionálne Ochránárske Združenie' ". Well, hm, then fine...why not, yes, right... ok.

And we cycled to Devin castle that sits on the cliff high above the river. The Danube, the deepest part of a depression between Karpathian mountains and the Alps, is divided into four distinct sections by three natural passages: Passau, Devín/Hainburger Gate, and the Iron Gates. Here in the Little Carpathians mountain range, the Devin gate was formerly known as "Porta (doors) Hungarica" and always was an important strategic line & trading route connecting Northern Europe with the Mediterranean. It has been settled since the Neolithic Age and fortified even since the Bronze and Iron Age, then continually guarded since the Roman times as it was a border of the Roman Empire. It was then a border of the Austrian Empire. Then, during the dark years of Cold War, It was part of the Iron Curtain between Eastern and Western bloc. It was then a border between Austria and Czechoslovakia (that part is today Slovakia).



So it was allays a dividing gate, the locked one, the threatening one, a gate that prevents, stops, makes one think twice before even planning to cross it. Then on 1st May of 2004, Slovakia entered the Schengen Zone and free movement of persons through the gate was allowed for the first time in the last... couple thousands of years. Not bad at all.

The castle offers one of the best views along the whole Danube (and made me think that it would be actually great to make a list of the best Danube views). It is one of the oldest castles in Slovakia, first mentioned in written sources in 864, and also an important national symbol for the Slovaks.

It was though interesting for us to see a donkey and sheep on fortress - a result of BROZ cooperation with the National museum. Maybe a bit unexpected partnership, but unconventional relations often create such great ideas :) After more than 50 years, the association restored the grazing in the National Nature Reserve Devinska Kobyla.

"Devinska Kobyla, this high landscape that borders the castle, is actually southern end of Karpathian mountains", says Andrea. "It is not that big as an area

but it contains forty percent of all plant species in Slovakia, with over 1100 botanic species of vascular plants. Through the LIFE project we cut trees in some areas and introduced goats as a steady way to maintain the habitat - it reduces spreading of non-native shrubs and helps to preserve original forest-steppe character of the landscape. But grazing is one of the most time and energy consuming tasks, and with ended support of that project branch (the LIFE for Bratislava region started in 2012. and ended in 2018.) we are finding other ways to keep it sustainable."

To prepare for this part of the trip I did some research by googling "BROZ" on the net:

How close were your relations with Castro, Nehru, Nasser and Gandhi, and what were your main activities in that period?

"BROZ was established in 1997. We focus on practical nature conservation and sustainable development support in the region of Western Slovakia, with the focus on Bratislava surroundings.

There are three main types of our activities:

- restoration in Danube floodplains or Low Carpathians;
- restoration of traditional land management including grazing in protected areas;
- planting trees.

At this moment we have eight ongoing big LIFE projects, but I am also very happy to say that thanks to the DANUBEPARKS budget we managed to plant 40.000 native white poplar clones trees in Dobrohošť municipality."

From the Devin cliff we descended to the confluence of Morava and Danube rivers. In the past massive amounts of sediment (mostly gravel) were deposited in the areas downstream from Devin gate, creating a network of meanders and river islands. One of these,



Sedlačkov Island, is today an important drinking water supply source water to Devin district, and due to its preserved native floodplain forests it is also a nature reserve with the highest, fifth level of ecological protection in Slovakia. The zone is part of European network of protected areas NATURA 2000 - Bratislavské luhy.

But in the recent past, after a typical shortsighted decision, the river branch that separated the island from the mainland was cut from the river by an embankment. Water passage was reduced to a modest pipe going through the embankment and that initiated gradual drainage and disappearance of the branch. What was created was actually a one-way sediment "collector" and a fish trap. During high Danube levels water was spilling over the embankment, bringing sediment into a branch where it was deposited. Fish could also easily get in, but as soon as the water level decreased they would become trapped in the branch where they were facing extinction. During the time the branch practically disappeared and the island was actually not an island any more. Animals who need flowing water disappeared. But they were followed also by those who live in still water, due to shrinking living space.

In 2015 BROZ started revitalization works in cooperation with state water management authorities. After one month of cleaning and removing embankments the result was 1-1.5 m deep channel, 1.8 km long. That started a process that will continue in the future: the constant water flow now can remove sediment from the channel. Situation is now better from the point of flood protection and even for the drinking water supply company: before the revitalization the deposited sediment was increasing levels of magnesium in the water, which required more chemical processing to make it ready for consuming.

Velký Lél ***A paradise (re)conquered***

Couple of days later I meet Andrea again on the biggest island of Slovakia. It has an area of 300 ha and got its name after Hungarian commander from 10th century, Lehel or Lél.

Velký Lél belongs to the village Zlatná na Ostrove (something like "Golden on Island") and the earliest reference (1094.) mentions village under the name Locus Aureus. There is reason that gold is part of both names - Adrana tells me that it was common to wash it here. And even today, if you are lucky enough, you could spot that unique glitter somewhere in the sand... Gold in the Danube, gold washers on the Danube? Now that was a surprise: after two international cycling trips along the river and countless trips along its Serbian part, that aspect somehow never came to my mind. As I mentioned (and will probably mention it again), this trip is something completely different...

For its wildwood forest preserved in rarely seen condition, the island was declared as nature reserve in 1974. But when BROZ came to the Velký Lél 13 years ago, the main problem was the dying local side arm.

There was one native cause for this: the Gabčíkovo Sub-basin is the deepest part of the Danube Basin and the river has been forming an inner delta from Vienna to Budapest for centuries now - it is going wider and makes more branches or offshoots, while some disappear. But the main reason was that this area was under the influence of the huge Gabčíkovo dam. When it was built, the dam came in a package with large dams along the river banks and with highly increased water management activities. The power plant as an enormous consumer that needs all water directed into the main channel and that turned former flooded areas into a more or less dry land.



My accommodation on Velký Lél: mobile rustic romantics. Or a rustic romantic mobility. Or a mobile rusticness that was romantic too :)

Above all that, some 20 years ago a concrete dam with road was constructed to allow for an easy access to the island. That was part of planned construction of water power plant Nagymaros -which then was never built - but it slowed down the water flow through the branch, which gradually got clogged by sediment and trees. Similarly to the Sedlačkov Island, Velký Lél was also almost completely connected with the mainland.

The island's future started to look better when in 2004-2005 it became a part of Special Protected Area "Dunajské luhy" ("luhy" - flat plains) and was included in the European network of protected areas Natura 2000.

Then in 2014-2015. BROZ cleaned the side arm through another LIFE program, removed embankments and concrete barriers. The last to remove was

the concrete dam with road and it was replaced with a bridge. In addition to cleaning the side arm, this was the second most expensive thing in the project.

All this measures restored proper water flow, enabled fish to reach its spawning zones on the island and improved feeding and nesting conditions for water birds. Successful cooperation with the State water management company made it possible to determine exact minimal amount of water flow that is needed for an unobstructed navigation of ships in the main flow of the river - that was the most important input in the whole process.

But the island itself has its own life-giving artery that was also in bad condition. There is a narrow channel that takes the water from the side arm and brings it into the middle of Velký Lél. It was built by the locals in the last centuries, but interestingly with an opposite purpose than it has today: it was draining water from the pastures after regular Danube floods that occurred 2-3 times a year. Nowadays floods occur once a year or even once in three years, and in summers with little rainfall this is not enough to ensure grazing, existence of habitats and survival of animals depending of them.

That's why BROZ started reconstruction in 2018 and the channel has been restored in the length of 690 m. Its sluice gate now enables migration of the fish and other aquatic animals.

And the island finally come into full life. Today it represents a unique mosaic of forest, wetland and grass habitats. Riparian forests with ash, elm oak, willows and poplars cover almost half of it. Its meadows are maintained by horses (20), sheep (50), cows (60-70) and goats (50) from BROZ eco-farm. Since 2009. with the help of these animals they managed to remove non-autochthone herb and tree species.



The landscape of the island is perfectly rounded by mighty, solitary oaks in the middle of two huge meadows. There are five levels of nature protection in Slovakia, the first being weakest and fifth the strongest. All levels allow visitors to enter freely but levels 3-5 reduce moving around to designated paths only. Velký Lél is under 2nd level of protection, meaning that construction works are not allowed here. And there are zones with stronger protection - for example the trees on the edge of this meadow are under 5th level of protection.

"So you can see here in one place all the main activities of BROZ that we mentioned the other day", says Andrea,. "Water measures/restauration, grazing and planting."

Local people who didn't pay much attention to the island in the past are now attracted by its new makeup. They come to participate in "horse days" and to socialize. (It is also worth mentioning that new working places were opened on the farm and in the new, modern camping, both situated on the mainland close to the entrance of the island.)

Equestrian clubs have their summer camps here. There are camps for children too: this year there were six of them during summer holidays. They were full booked already in May - a proof of a high interest. Slovakian branch of computer technology company DELL hold their team building activities here. They also have "DELL planet" program and as a part of that program send here employees who spend a lot of time sitting in front of monitors. They help in farm and in other activities while getting chance to be released from the sedentary lifestyle at least for a short time.

Sounds like a real idyll. But I checked "BROZ" on the net again, and...

Did you or did you not nationalized the land here, while giving original land owners only a symbolic compensation? There are also some assertions that ruling system on the island is a dictatorship?

"In 2006. we actually leased and purchased most of the island, and we also own the farm. This was done for the purpose of nature conservation and allows us to efficiently apply measures for the improvement of different habitats on the island. We can control things and be sure that in the future, with the rise of the island popularity, there will be no weekend houses or that some other weird infrastructure won't pop-up here."

Hm... ok. And what we can say about your activities in the frame of the project DANUBE parksCONNECTED?

"The main activity for us is WP 5, the dry habitats. And within a successful cooperation with the NP Donau-Auen we send our flocks to graze their dyke. We have our own transport vehicle to facilitate that. Then we are active in the WP 6, forest work. As already mentioned, through that package we planted 43,000 seedlings of native tree species.

During the project I visited so far Ingolstadt, Wachau, Fertö-Hansag, Duna-Ipoly, Kopački rit, Persina and Rusenski lom.. And I will visit "Serbia forests" soon .



As an organization, through the DANUBEparksCONNECTED we learned that there is a lot of difference between countries in approach, paperwork, position of NGO's in state. Colleagues in Germany and Austria are straight mainstream while we... we kind of meandering here."

What would be main reasons to be satisfied with your work as an organization? For example you have - let me google „BROZ“ again... you have 119 awards and decorations from 60 countries around the world, including French Legion of Honour and National Order of Merit, the British Order of the Bath, the Soviet Order of Lenin, the Japanese Order of the Chrysan-

themum, the Cross of Merit of Federal Republic of Germany, Decoration of Honour for Services to the Republic of Austria, the Order of Merit of Italy, etc?

"We restored 70 km of side arms at different places and planted 200.000 trees so far. State authorities have respect for us. (Ok. their image of us as a successful organization is sometimes counterproductive - they don't understand why we need another LIFE project.)"



The marmot breeding zone on the farm :)

And to all this important things I would add something small that made me smile when I took a look at - finally founded - BROZ web site: they promote an action called "Adopt a goat guard". And they explain: "By symbolically adopting a goat, you will help us to restore the precious habitats of pastures and meadows as well as to restore the cultural phenomenon of grazing to our ambience".)

Well dear Andrea, is there anything else you would like to add at the end?

„Read the book 'Secret life of trees' by Peter Woehleben. It tells about forests as social networks and how trees feel, communicate, help each other, live like human families. A true gem and sort of mind changing material.



Fertő-Hanság Nemzeti Park - Szigetköz Protected Land- scape Area

Riding along pleasant paved road on the dyke that took me right from the heart of Bratislava (and, how convenient, through the Protected Landscape Area Dunajské luhy, i.e floodplains) I passed by village Čunovo (Dunacsún) and came very close to Hungarian border. Here was a crossroads where a traveler along the EuroVelo 6 can decide whether to turn north, crossing the Čunovo dam to water sports centre Divoka voda and continuing to hydroelectric power plant Gabčíkovo on Slovakian side - or to turn south, leaving the dyke, entering Hungary, then continuing towards still distant Budapest via Győr.

And that's where I met my new hosts and cycling friends from Hungary. Mr. Attila Fersch, project manager from Fertő-Hanság National Park (FHNP) head office organized the ride, but also invited the local guru Mr. Zoltán Fűzfai, president of "Pisztráng Kör Egyesület" (Trout Circle Association) to guide us on two wheels.

The Szigetköz is an island with a lively landscape, 53 km long with an average width of 6-8km. By its total area of 375 km² it is the largest in Hungary. This "Child of the Danube" lies between the Mosoni-Danube channel and the old-Danube, in the Golden triangle 80 km from Vienna, 30 km from Bratislava and 140 km from Budapest. The whole area is 50 km long in straight line, but total length of its side arms - from narrow streams to wide ones - is almost 800 km. With Slovakian island Zitny Ostrov and tens of other smaller islands and side arms, it forms the biggest inner delta of the Danube.

In the times of Austro-Hungarian Empire, its powerful navigational lobby had an ambition to constantly expand its activities and to develop the infrastructure for navigation. That is why a new channel for ship traffic was made in 1886-1896. from Komárom to Vienna and its sides were stabilized by stones. Before that Szigetköz was just a maze of small arms and branches - a kingdom of thousand islands.

At the past, ripples of the human migration touched only the outer rim of this wonderful world - its swamps have protected the islands' wildlife from more interference. In modern times it was exposed to consequences of too ambitious human plans and actions (more about that later) but is still alive.

But it is not only the idyllic biosphere gem that has to be preserved here: the Szigetköz aquifer - a thick gravel layer that lies several hundred meters below the river bed between Bratislava and Győr - contains 14 cubic kilometers of clear water. That is the largest drinking water supply in central Europe, with the daily output measured in millions of cubic meters both for Hungary and for Slovakia.

The Szigetköz Protected Landscape Area is one of three PA that are managed by Fertő-Hanság National Park. It was established in 1987 and has an area of 10.000 ha. The PA preserves softwood and some hardwood river forests, as well as pastures of very good quality - both for grazing and as a source of hay.

Besides usual bird species such as storks, herons, black kites, little egrets and others, people from the NP are especially proud of the white-neck eagles who returned here after 40 years of absence. The explanation of that happy event at the same time shows how close and how connected is the European habitat: Scandinavia developed very good protection programs for eagles and poisoning there has ceased, which led to a sharp increase of the eagles

population. Leaving and hunting space become too tight so some of them started to migrate to other regions, and 4 pairs ended here.

On the Mosoni-Duna side arm we came to the "Trianon" lock/slucice - an important element for controlling water level in the arm. In 1902 the nearby town Mosonmagyaróvár suffered a catastrophic flood and that started demands for more control of the side arm. In 1905, the Mosoni-Duna was stabilized and the sluice had the role to prevent high waters from going to the city. It was believed that the Mosoni-Danube was still important as a waterway so the sluice actually was planned to be a shipping lock and built as a bridge that could be rotated to ensure passage of vessels. However, it never worked as a ship lock and the bottom part of it was never built.



The Trianon lock

This zone is actually strategically very important as it is a key to regulation of water levels all the way to Győr - this is why Hungary fought to keep the lock on its territory in hard times, after WW I and WW II. (It was even part of the Paris peace treaty.)

Water sports: neighbors playing hydro-electric power games

Gabcikovo-Nagymaros barrage system was one of four major engineering projects after World War II that were to change the course of the Danube. (Other three being the Iron Gate dam(s), the Rhine-Main-Danube Waterway and the Danube-Black Sea Canal). In 1976 the governments of Czechoslovakia and Hungary agreed to construct the Gabcikovo-Nagymaros Barrage System to correct bad work of the mother nature - a popular ambition among ruling circles of many communist countries at that time.

The system would consist of a reservoir, two diversion canals and two hydro-electric power plants: Gabcikovo in present-day Slovakia and Nagymaros in Hungary. The whole system would stretch from Bratislava to Nagymaros, on an enormous length of 200 km. The Danube would be diverted into a new, artificial channel (lined with plastic, to prevent seepage!) by a barrage at Hungarian village Dunakiliti. The channel then would be used to produce electric power, plus as a main route for water navigation, plus to provide water supply in the wide region, plus (working together with other elements of the system) to prevent catastrophic floods.

Gabcikovo power plant was designed to produce 720 megawatts of electric energy and to operate in periodic water surge. After passing the dam each of such surges would go downstream as a flood wave, and then would be absorbed by a 160 megawatt strong power plant at Nagymaros.

Political regimes changed in 1989 in both countries and environmental consciousness increased in both countries - but in Hungary it had strong political connotations. In 1980 Hungarian scientists and engineers openly criticized the project, but local environmentalism was also closely linked to the constantly increasing bigotry towards symbols of the old regime. Gabcikovo-Nagymaros project was seen as a typical arrogant communist project and rapidly attracted strong political and public opposition. (The

first grass-roots environmental organization of Eastern Europe, "Committee for the Danube", was actually born during that campaign.)

In 1989 the Hungarian government eventually one-sidedly decided to abandon the works at Nagymaros and to maintain the status quo at Dunakiliti, stating that environmental effects of the project must be further examined.

(The success of Austrian environmentalists who - as was mentioned in our Donau-Auen story - stopped plans to build a hydro-electric power plant in a nature reserve at Hainburg, added a new twist to the events: the "ecologically-shaken" Austrian government offered bank loans in 1986 and managed to cast a deal that would bring to Austria one-third of the expected total power produced by Gabcikovo-Nagymaros sys-



In 1985 this area was completely cleaned by mechanization. After the original Gabcikovo-Nagymaros project was abandoned, it recovered by itself.

tem. When things got complicated, the compensation that Hungary was supposed to pay to Austria for braking that financial deal was an extra addition to other bitter pills to swallow.)

But the worst surprise was yet to come: during 1991-1992 in an unexpected move Czechoslovakia (i.e. Slovakia) diverted most of the Danube to their territory after blocking its riverbed in Čunovo by a "temporal" first-stage dam. A second-stage dam was built at Gabčíkovo. In the sensitive time when Czechoslovakia was splitting into the Czech Republic and Slovakia, the project became important symbol of Slovakian national identity, facing not only Hungarians but Czechs too.

The diverting drastically reduced the amount of water on Hungarian side, badly damaging water supply and environment there. Before the diversion the average flow in the old Danube was 2000 m³/sec and after that it was 400 m³/sec, according to Slovakian sources, or 300 m³/sec according to Hungarian sources. (The level of water in the old river channel is almost 2 m below the lowest value recorded before the diversion.)

So:

- instead of common Slovakian-Hungarian system, all elements of the reduced system and most of the Danube water went on Slovakian side;
- Nagymaros plant was never built. And this has led to a huge problem (to add to other huge problems) because of an additional function of that plant: it was supposed to raise the water level on 110 km upstream distance, allowing ships to navigate on that section. Without it, low levels of water on that stretch are the main navigation obstacle on the 2400 km long Danube corridor;
- Without the Nagymaros dam the Gabčíkovo power plant operates in „normal running river“ mode, instead of projected periodic water surges

mode and thus is unable to reach optimal energetic and economic efficiency – it provides only 8% of Slovakian energy needs.

If all this happened between two other countries that I know (and I live in one of them) we would probably settle the things on an old traditional way. But in 1992. Hungary and Slovakia wisely decided to take their dispute to the International Court of Justice in Hague. Two Central European states for the first time on court – it was closely followed as it was supposed to be a showcase of European way to settle disputes. In an ambitious try to understand and summarise what was otherwise brought in 22 volumes, 9000 pages and 24 kilograms of paper it would be, um, this: Slovakia basically wants Hungary to build the Nagymaros dam. Hungary requests Slovakia to do regulation works on the problematic stretch upstream from Nagymaros and obviously to return the Danube water.

Couple more examples that show how complicated the legal things could be:

- a) Did the Čunovo-Gabčíkovo solution, as a crippled variant of the originally planned common system, changed the national boundaries of Slovakia and Hungary? (This was one of the most difficult matters of the case. Three treaties from the past and international law consider the boundary as the main navigable channel of the Danube at the lowest navigable level. The main navigable channel now runs through the water reservoir at Čunovo and the inland canal, both of which lie in Slovak territory. Slovakian view is that these treaties were violated by Hungary, who unilaterally withdrew from the project.)
- b) The Danube is the only major waterway linking Hungary with Northern Europe. When it is diverted onto Slovak territory, a significant part of Hungarian trade can be tariffed. (That can be resolved only by transporting goods via Austria, but at an increased cost and takes more time.)

As with any clever court involved in such sensitive dispute, this one didn't definitely resolve the case until 2017, when both sides started to seem pretty tired of it. Which opened chance to close the unpleasant story on a decent way: with anyone equally unsatisfied. All that was the legal aspect. But the environmental impact of diverting the river and building two dams was immense, that's why the International Rivers Network ranked the project among the top 10 most environmentally destructive hydraulic engineering projects in the world.

- Loss of thousands of hectares of forest flood plain, agricultural lands and Danube countryside.
- After the closing of the old river bed, water in some branches of the Danube fell by 2m while some other branches dried completely and the groundwater table fell 4m below the soil. The unique wetlands of this Central Danube region were dependent on a steady water flow in its many channels – drainage of flooding areas and wetlands badly influenced plant and organic species. It threatens to dry up the last inland delta of Europe, comprising of two large islands Szigetköz and Zitny Ostrov and a very dense branch system in the supporting flood plain area.
- The absence of the Nagymaros barrage caused intensive degradation of the Danube river bed downstream, with increased sediment supply and reduced flood capacity.

One aspect that seems to be improved according to joint Slovak-Hungarian studies is stabilization of groundwater levels and local improvement of groundwater quality. (Impoundment of the Danube allegedly improved ground water quality on right side of Danube, at Rusovce and Čunovo water supply.)



And it seems that the destiny of this location was always to be an important spot on the river, as even its name suggests: Turkish word "kiliti" means "key" (of the Danube).

Attila Fersch says that the FHNP was involved in four work packages of the DANUBE parks CONNECTED project and explains results:

- The Wild islands package: detailed revitalization plans prepared for several islands and will be used in the future works there.
- The Danube forest corridor: collected info about natural and artificial forests for the Danube wild mapping.
- The Danube dry habitat: monitored species and numbers of orchids in the PA.
- Danube free sky: cooperated in the process.

For him, one of the best long-term results of a National park presence here is something quite specific and not visible to an average visitor: the development of a successful cooperation with local people: "It is not possible to achieve good results if locals are not satisfied and motivated. The Protected Area ideally should serve not only nature but also local stakeholders, it is necessary to work at the same time with locals and with the nature."

And while we approach the Visitor center of the PA in Dunasziget, built and run by the "Trout Circle Association", he gives our guide Zoltán Fűzfa and his touristic business as an example.

"The center is eleven years old", joins the conversation Zoltán Fűzfa, "But it is still not 100% finished. The reason is that we prefer recycled materials for building but also want quality and functionality. The roof is, for example, made from 18,000 tiles collected from 18 old houses."

The center has a very nice exhibition of wildlife in the Protected area as well as an educational space, but what made the strongest impression on me was the space at the photo below, that looked like a beach volleyball court (actually several of them tied together).

This is an area that the Centre rents to water research organizations and it is used to make very precise and detailed models of particular Danube zones in Hungary. Such models are then used to investigate in real time possible results of interventions planned in different projects.

There was no formed model when we visited, but you can see one on the photos above. (Taken from brochure "Mutual facilitation of revitalization of inundation area and river branch system of the Danube in the Szigetköz - Csallóköz region - Short summary of the project results".) The two marked human figures on the top illustrate the scale of the model.

And Zoltán is the right person to tell more about the Trout Circle Association (TCA) activities: "We are an environmental education organization, founded 21 years ago. And we became an official partner of the Fertő-Hanság because the NP doesn't have personnel that deals with that subject while the Trout Circle Association has 3-4 employs with necessary qualifications.

We offer wide scope of possibilities to visitors of the PA: besides the Visitor Center, camping and classic accommodation space, they can enjoy canoeing or combined canoeing-cycling tours. There is also a forest school where kids typically spend five days, learning in the nature.

There are six employees in the association, all of them university education and we developed a lot of new ideas and interactive themes. Being a president of the association, I am especially satisfied that we are well known not only in the region but in the whole country, despite the fact that our scope is not mass tourism but eco-tourism."



Zoltan with the collection of rocks taken during the years of travelling and kayaking along the whole length of the Danube

And our pride is our eco-mobile fleet: 8 canoes, 32 bicycles and a trailer that can transport all this together. Our formula is: 32 persons with 8 liters of diesel fuel. In the biggest inner delta of Middle Europe you can discover lots of natural values. The greatest experience can be when you can tour the most special places by canoe, bicycle or on foot."

To have trailer for bicycles and another trailer for canoes - that is not something new. But Zoltan's idea was to have one trailer for both. And that became the TCA's speciality and trademark: "We were first to develop this concept which then defined specific programs for guests. Now a lot of other NP's and tourist agencies use the idea."

At the end, we couldn't leave the Centre without experiencing some kayaking in the Szigetköz labyrinth that Zoltan, after traveling and paddling everywhere along the Danube, declares as the best kayaking space on the whole river length.



We continued our ride along the Szigetköz dam, and at location Denkpal came to the first fish pass that was built in Hungary, back in 1998. The channel bridges 4 m of height difference between the main riverbed and the side arm system. The difference is result of a process in which the bed of the Danube

continues to deepen and its water level decreases, while the branch system is feeling with sediment. The cause that triggered this process can be dated back in 1170 when the first barrier on the Danube was constructed in Geisingen (today Germany). Since then, nearly 60 (currently operating) dams were built on the river...

The major function of the channel's control gate (with its regulating closure) is to prevent the artificially supplied water in the side arms systems of the Szigetköz from flowing freely into the Danube. (In 1994 Hungary begun to pump water from the depleted waters of the old Danube to revive the wetlands, which has helped to replenish streams but also created an environment in which people can recreate again.) The other role is to adjust the water level in the side arm. A monitoring that was conducted several years ago detected 347 fish from 22 different species in the fish pass.

How long is the Mosoni-Duna side arm? From Mosonmagyaróvár to Tanzania - just ask Zoltán Papp

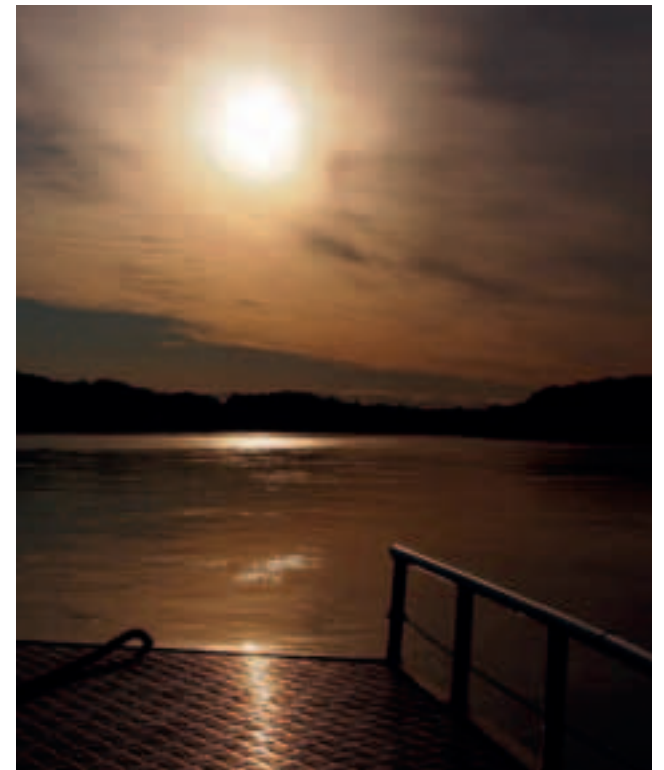
It was a fortunate set of circumstances that I get into a longer conversation with another Zoltán from our cycling group, because at the beginning he seemed a bit shy to use his English. But it then turned out that Papp Zoltán was a really interesting person. Being a mechanical engineer and describing himself as a bike designer, this nice gentleman from Mosonmagyaróvár devoted a lot of time in the past years to design a cargo bicycle that would ease the daily water and goods transportation for poor people in African countries - being at the same time robust, simple and cheap enough to be produced locally:

"After a short training programs fostered by me, local mechanics or repairmen should be able to

produce these simple bikes by themselves and with simple tools. This doesn't help only the users, it also supports the small entrepreneurs. All in all, it would help local people make their living at their hometowns."

He did not hesitate to examine his ideas on the spot, traveling to Tanzania couple of times and working with local candidates for his "Cargobike for Africa" project. More details on the web site www.cargobike.africa (the video at the beginning shows bike in action).

All the best Zoltán, we wish you wind in the back with this noble plan :)



Duna - Ipoly National Park (DINP)

This National Park seems to nicely travel along the Danube with you - from Esztergom all the way to Budapest, it is always there or nearby, a friendly but unobtrusive touch on the shoulder. Unobtrusive... if you don't know about it while riding the EuroVelo 6, it will silently stay aside in the hills above the river, in Pils and Visegrád mountains, in the Börzsöny range, on islands, wetlands, and floodplains. There is a lot of hidden beauty here, just a short train ride away from Budapest.

Where that second part of the park's name comes from? Ipoly (Ipel) is a 232 km long Danube tributary with the source in central Slovakia (Ore Mountains) and the confluence near Szob in Hungary. One part of its valley, between the towns of Hont and Balassagyarmat, belongs to the National Park.

Established in 1997, it is the ninth and the youngest, but at the same time one of the most diverse national parks in Hungary. Besides its area of 60,314 ha, the Park's Directorate also takes care of 8 Protected Landscape Areas, 32 Nature Conservation Areas, one area recognized by a European Diploma for Protected Areas and a Biosphere Reserve of Pils mountains. It is also part of the EU Natura 2000 nature and bird protection network. The uniqueness of the park comes from a mixture of three different landscape types: river valleys, mountains, and lowland. Of its 191 species of birds, 40 are protected by law. Some species of flora and fauna have their sole habitat here.

The Directorate has to find ways to save these rare and endangered species, protect the integrity of the wildlife, plan and implement the conservation measures, and let's not forget the preservation of cultural and historical values - all this (a bit similarly to the Wachau region) in the crowded central part of Hungary and amidst dense infrastructure and industry, including Budapest. So expect some magic to be unveiled later here :)

One interesting development is that there are now more and more signs of habitation by Eurasian beavers and lynx, two species which had previously disappeared completely in this region.

The region is the cradle of numerous cultural values as well. Traces of prehistoric humans have been found in the caves., while the Börzsöny is home to Drégely Castle, an important site in Hungarian history. Fine examples of mediaeval ecclesiastic architecture include the ruins near Pilisszentlélek and the monastery of the Order of St. Paul at Márianosztra. The Park also has local history houses and museums which present the culture and life of the region's German minority, which was settled in the area in the 18th century.

The emblem of the National Park bears an image of a rosalia longicorn, which is associated with old beech forests as its larvae develop in the rotting wood of dead trees. Its wings are brilliant steel-blue and black, and its long antennae bring to mind a string of pearls. It is a protected species, known as rosalia alpina. The choice of the emblem also symbolises that the mission of nature protection is to safeguard life in all its forms.

To start my visit in Esztergom's part of the Park I needed to cycle 6km out of this charming historical town. Then

I came to the Kökőrcsin Ház ("Anemone house"), the headquarters of the NP, where I met **Szilvia Németh** and **Gergely Kálmán**.

With his University degree Gergely started career in the park as a tour guide six years ago, then after three years became a communication officer at park's Department of environmental education. His job is to introduce values and qualities of the Park to visitors, and to explain to public why their measures and actions are important: "This is one efficient way to provide nationwide support for our activities and to be sure that enough people will always stand behind us."

DANUBE parks CONNECTED gave Gergely chance to check how the public relations strategy was applied in Fertő-Hanság and Kiskunsági National Parks, while Djerdap NP is currently on his wish list.

The area definitely has an interesting past: At the first place, I was surprised to learn that the Ottoman occupation of Esztergom region lasted for 150 years. That long? Phew...now these 300 years of Ottoman occupation of Serbia seem a bit more... acceptable.

And then: the spacious, hill zone around the Kökőrcsin Ház was used as a military exercise ground since the end of WW I well until the nineties of the last century, when Russian troops left the region. And the house itself was actually built to be the officers' headquarter. And the concrete surface on the parking lot is 60 cm thick - it was made to bear the weight of the tanks. And the nearby small lake is called Killer lake: it was used to practice operating tanks underwater and one day a complete Russian crew in one of them drowned.

And... and today it is a Protected Area (*) that sees 3000 visitors per year, mostly school children. There is space to accept 50 of them at a time, for an educational stay. There is an exhibition on the second floor of the house, presenting values of the area.

() There are two levels of nature protection in Hungary: Protected Area and Strictly Protected Area. Visiting a SPA is allowed only with the escort of the rangers.*

The whole Danube in Hungary is declared as a Natura 2000 zone. (But an interesting fact is that the PA's of Hungary provide higher level of protection than the Natura 2000 zones.)

Maximal penalties for damaging and destroying protected species of flora and fauna in Hungary are in the range of 3000 eur, and the worst cases might include imprisonment. But while the maximal penalty for the white-tailed eagle is something that one could expect, the intrinsic values of some other protected animals can be quite surprising. For example, the "worth" of brown bears or wolves is under 800 EUR, while one species of humble (but very rare) forest mouse is in the same category as the white-tailed eagle - 3000 EUR. To see more check this page.

My hosts took me to the Strázsa ("Patrol") hill Study Trail. All hills in the region are Triassic, 230 million years old limestone formations and the highest of them has an elevation of 730 m. Strázsa is much lower, but approves its name: one can scan large distances from its peak. Before reaching that point we experienced a diverse landscape: first treeless and sandy grassland, then sheer strength of a karstic cliff with its characteristic shrubs and including a quarry that was used until 100 years ago. There were several protected plants species along the way.

Except for this walk, Kököröcsin Ház offers to visitors the "Bunker" tour: you can visit a few of these interesting remnants from the area military past.



View of Esztergom from the Strázsa hill

We walked a bit more through the fine landscape behind the Strázsa hill. After a few days of strong rain, spots of dainty purple color here and there marked Szilvia's and Gergely's bellowed "pets": orchids. Happy and passionate, they knew the exact place even before we would arrive there, and after a while I was curious did they even give a name to each of the plants. A bit of giggling and then I got this confidential information: "Orchids have some kind of a character and they are a bit mysterious too. They disappear for a couple of years - sometimes even

for six, seven years - and then come back. This one here, for example, reappeared this spring, after two years."

Back to the Kököröcsin house for a quick walk to the Killer lake before saying goodbye to my hosts. Its water level is observed and adjusted by the Park's stuff, but at this moment it was empty: the local government was financing cleaning its bottom from metal artifacts (again, remnants from the military past).



Between 1914 and 1918 one of the largest Prisoners of War camps of the Austro-Hungarian Monarchy was located in the military exercise field surrounding Strázsa Hill. Many of the prisoners fell victim to epidemics and were buried in eleven cemeteries - this is the Cemetery No 7, with graves of 1548 Italian, Romanian and Serbian prisoners. When the Soviet army took over the area, the cemetery was neglected and gradually covered by scrap. It was cleaned and renovated from 2007 to 2009 with the joint effort of the Hungarian Institute and Museum of Military History, Ministry of Defence, Municipality of Esztergom, Cultural Society "Honved", Duna-Ipoly NP and a number of volunteers. Among participants at the opening ceremony on 1st July 2009 were representatives of Italy, Russia, Romania and Serbia.

Szentendrei island

After cycling from Esztergom, past the former royal seat Visegrád and its impressive castle, I took a short boat ride to Kisoroszi - a small village at the western end of the Szentendrei island, right in the Danube Bend.



The plan was to meet Gergely again next morning for a cycling tour, but I decided to use the rest of this day to visit the western tip of the island: it looked promising on the map. And it was a lucky decision - those late afternoon hours turned to be among the most beautiful on the whole Danube trip. The late sun turned pebble shores into a gold mine with smooth, huge nuggets all around. And it was impossible to get enough of the picturesque panorama of riparian forest, permeated by shadows and shallow water, nor it was possible to leave it with a glad heart to the melting power of incoming nuances of the night.

Next morning I rode to Tahitótfalu, a small town that is, like Budapest, very logically :) divided by the Danube to Tahí (the mainland part) and Tótfalu (the island part). Tótfalu and its sandy soil surroundings are famous for wines but maybe even more for growing strawberries.

A small band for the island cycling experience included **Gergely**, the Park ranger **Balázs Fehér**, and **Sasha Draskovic**, a friend from Budapest.

There are 30-35 rangers in the Danube-Ipoly NP but that is still far from enough, considering the Park's

size. So each ranger covers a huge space: Balázs, who works in the Park for six years, takes care of a territory that covers seven villages and has an area of - 60.000 ha (!) That is why his shift usually means a week or more of a constant presence in the field, and he doesn't return home during this time.

The first interesting thing to see on the island was one of its sandy zones, nowadays used for grazing. The fine sand here was covered with naturally grown bushes and shrubs. This was home for many protected plant species, including feather grass (*Stipa borysthena*), a post-glacial relict and an endangered species. "People used to pick it just because it looked nice and they wanted to take it home", says Balázs, "But education helped to change that habit a lot."



A landscape with the feather grass

Despite being close to densely inhabited areas, the island is not under pressure of illegal construction (unlike the hilly regions of the Park):

"We generally get on well with local people, there is sometimes just a lack of knowledge about the Park rules and regulations. For example some don't know that they must have a permit for grazing and haymaking. But this is a Natura 2000 zone and that entails certain conditions for human activities. Haymaking will start after orchids finish flowering - within a month, their flowers and leaves will disappear, leaving only underground tubers that will be safe from cutting tools or moving machines. Grazing begins in

June, and it will be only horses. It is not that we specifically favor this sort of domestic animals - the situation is that the local person who uses these pastures keeps only horses", explains Balázs.

The biggest wild animal in Hungary? Yes, the scale goes up to bears. Last year one entered the country from the Czech Republic (that is also where wolves usually come from) and it was a big media news. The bear managed to go quite far southwards before being caught, marked with a tracking device and transported to the mountains in the north. But Hungarian forests are generally not big enough to provide the "full comfort" to a bear.



At an old branch of the Danube. This was an island and the river was flowing here before sedimentation closed the passage. Zones like this one are now very important for fish reproduction: there are species (carp for example) that spawn only in standing water. There are a lot of invasive plants (pale green color on the photo) such as the Green Acer, that repress the original species, which is the major conservation problem on the island. Unfortunately, there is no efficient way to prevent this process. The approach with mechanization is very difficult, and clearing invasive plants wouldn't help for long anyway - the Danube constantly brings new seeds.

The Szentendre island is a very important source of drinking water for Budapest. This potential was discovered in the sixties of the last century, the land was nationalized soon after that and the arterial wells system that was built consists of hundreds of units. Each well is actually a vertical duct that goes 20-30m deep in the ground, and then there are thinner, 20-30m long horizontal side pipes that branch from the vertical duct. All wells are connected to a central collecting station with strong pumps that pull water from this arterial network. The water thus obtained is so clean that it does not need any processing, apart from adding a bit of chlorine to take care of eventual impurities in the city pipelines.

The amount of plastic bottles in Hungarian part of the Danube is decreasing. As about general pollution, the Danube cities are quite "friendly" while smaller rivers like Tisza are bigger problem. Budapest has a processing plant for waste water, Szent Endre has its own, etc. (All these plants were built roughly 10 years ago, after Hungary became an EU member.)

After informing me that the Park plans to build a large Visitor Center in Dömös, Gergely notes that cycle tourists who travel along the EuroVelo 6 practically don't visit the Park. Which is really something to think about: it is necessary to specifically promote the Duna-Ipoly and other protected Danube areas both by European cyclist's federation (who manages the EuroVelo routes), as well as by national EuroVelo coordinators.

The secret worlds of Budapest

A series of highly surprising discoveries in the Hungarian capital started in Buda Hills: right in the middle of a densely inhabited area whose streets were dotted with nice upper-middle-class family homes,

close to a city public transport station, right there, just like that... was the entrance to Szemlőhegyi cave. Which sees 30-32,000 visitors per year. Just like that.

András Hegedüs, an NP employee and passionate speleologist, member of the Cave Rescue Hungaria and my host in the cave, looks young but he managed to pack in his pockets as much as 25 years of work experience. And his speleological history is even longer than that: he started early and chased caves in Hungary, France, Italy, USA, Romania, Montenegro, Serbia... (He greeted me with a nice basic Serbian vocabulary even on the phone, before we met.)

"The cave was discovered in 1930 and was opened for tourists in 1986. It is currently explored in a length of 2200 m and visitors can walk on about 250 meters of sidewalks and stairs. It underwent the last general reconstruction in 2013, when access was provided also for disabled people. The light system was improved in 2018, and since next year visitors will be able to watch 3D movies here."

Being one of the most valuable natural treasures of Budapest and offering rich forms and ornaments, Szemlőhegyi is placed under increased protection. Such examples of pisolite precipitations and gypsum crystals are hard to find anywhere else in Europe.

The clear and dust-free air of the cave offers a therapy to treat asthma and other respiratory organs problems: 2-3 hours a day / 2-3 times a week, with a doctor's referral, and treatments are free. And while being there for medical or just tourist motives, one can see an exhibition showing the most important caves of the Buda Hills.

Caves, yes... There are more than 4000 of them in Hungary, and in Budapest there are more than 150! Thus, not far from the Szemlőhegyi there was another one that sees as many visitors, but boasts the long-

est underground system of Hungary: Pál-völgyi cave channels are 33 kilometers long. And again, this unbelievable world exists right below the basements of a densely populated area of the Hungarian capital.



Pál-völgyi cave

Opened for visitors in 1990, the cave is famous for its unique dripstones and fossilized seashells and to András opinion it is the most beautiful cave in the Buda Hills. We walked a bit more than 300m, but there are tours for advanced cavers that are 3 km long.

The last surprise for Sasha and me was again just a short walk away: the upper part of the Sas-hegy ("Eagle Hill", a translation of the former German name, "Adlerberg") is actually no less than - a Nature Reserve. A tiny island of pure nature at 257 m of altitude, surrounded by the sea of concrete and civilization, the patch of wilderness that lingers amongst the tall buildings, complete with a visitor center, guided tours, limited movement of tourists and a custodian to take us around.

"Well, Budapest is one of the richest cities in Europe when it comes to nature. Its flora is characterized by endemic species and there are Eastern imperial eagles only 30 km far from the city, in the heart of the

Duna-Ipoly National Park", says our guide **Gulyás Kis Czaba**, paleontologist and geologist, a local volunteer and supervisor in the Reserve. And he took us on a narrow, unbelievable trail that was twisting on the top of the hill between limestone and dolomite formations and flora and fauna dating from the glacier era - all this with a near-360 degree scenic view of absolutely all famous and important buildings of the pulsating metropolis below us.

The zone with Sas hill separated during the ice age. Before that it was a part of a warmer climate zone that was following the line Dunav - Vardar (in Macedonia). It is known that the territory of Pest (and most of what is today Hungary) was a marchland at that time, but the type of vegetation is unclear since it changed over the last 5000 years. There is only a small wetland area left today in the Pest zone and there are still reptiles, amphibians and other species typical for wetlands.

The circular trail is about 2km long and connects all corners of the 12 ha large Reserve above the slopes where, after the Ottoman occupation, German colonists planted orchards and vineyards. Since 1940s building of family homes and villas started to endanger that green zone, but during the WW II many of them were destroyed, especially during the siege of Budapest in 1944-45. (There is one old bunker on the trail that nowadays hosts a seismic station. And the curiosity is that the station was the first to register the recent nuclear bomb test in North Korea, thus starting an international crisis.)

Then in 1958 the hill was placed under protection and became one of the first nature reserves of Hungary. It was, however, too late for other nearby hills - they were already covered with houses.

Some species - like bird *Monticola saxatilis* (Common Rock-thrush) have vanished. And even that first protection of the Sas Hill was not very strong: the really efficient protection regime started in 1970.

The Sas Hill actually has two peaks and one of them is strictly protected, due to its valuable Alpine and Dolomites plant species. Today one can find here species that remained from the warmer period before the Ice Age, side by side with those from the Ice Age.

The most iconic plant of the Sas Hill is the silver grass (Pannonian blue grass, *Sesleria sadleriana*), dating from the glacier era. It normally lives at the altitudes of 1600-1700 m, in the Alps and Carpathians. During the Ice Age it moved far south and returned afterward but here, due to the separation, it was isolated at the altitude of 250m and became endemic.

There are also almond trees which are typical Mediterranean plants, but they were planted at the time of vineyards and there are still some of them left. Twenty years ago all non-native trees planted before the establishment of the Reserve were removed and they now monitor the situation. After all this time the process has not yet been completed - more time is needed to return the habitat to its original, very different state.

"You will also observe many lizards who love the environment and flora of the hill as well as its varying temperatures. The snake-eyed lizard (*Ophisops elegans*) is the smallest European lizard, very timid and hard to see, very special one", says Czaba and then sniggers proudly: "But we know exactly all his favorite points here so we spot him often enough. We also have here the Caspian whipsnake, *Hierophis caspius* - it is the longest snake of Europe and can reach 2m, in Dobrogea region of Romania there are even 2.5m long specimens. Unfortunately, there are only 20 or so of them left in the Buda hills, but the famous Jane Goodall Institute tries to preserve them here. Let's mention also the Zebra-snail, *Zebrina De-trita*, that is typical for the Dolomites but still present in our Reserve."

Budapest is good zone for migration birds, while Sas Hill produces especially good thermal currents.

That's why even eagles sometimes stay here for a while. (There is a "secret" Danube island where white-tail eagle nest.)

But there is another migratory species that comes in large numbers: there were 2200 visitors in March of this year, while average annual visits reach 23,000. I asked **Anna Vatai** - teacher, local volunteer and future manager of the Visitor Centre - is that too much for this relatively small area?

"We strictly control the movement of visitors while still offering them interesting programs to enjoy. For example, on each May 10th we have 'Birds and trees' day for schools and kindergartens but it is a family program as well. To get back to the question: the most important thing is that the Sas Hill has been preserved when it was declared as a Natural Reserve, and its important species are now safe here."

The last DINP station: Protected area Great island of Racalmas

After a long cycling (and rainy) day across huge Csepel island, I came to a small bridge in Rácalmás village to meet with ranger **Zoltán Kovács**. We crossed



the bridge to enter the Rácalmás island which is partially the National Park territory (4 ha) and Protected Area / Natura 2000 (356 ha).

"There are four islands on a 100 km long stretch between Budapest and Rácalmás and two of them are protected as Natura 2000 areas. This one is the largest and serves as a model of an ancient island on this part of the Danube. Two hundred years ago there were fields and people lived here. Then, due to migration to the cities, the island was deserted and today is mostly covered with forest. In the northern part, between the island and the left bank of the Danube, there is a swamp, suitable for aquatic birds."

Owner of the island is the state, while user is a forest company. They work here for 50 years now and Zoltán sees their influence as useful: "Working with us as partners, they helped to replace non-native poplar trees with original sorts on 70% of the island." Most protected species are plants but valuable ones include birds as well. There is one pair of white-tail eagles in the south part. Being here for 20 years they are old-timers but there is even a new generation now, two youngsters. However, they will leave soon as the parents will not tolerate competition.



Wild boar, red deer and fox are permanent residents. But they are not in a perfect paradise here because the island is a seasonal hunting area. It is also flooded in the average every two years, and at such periods the space for these animals is reduced to the west coast.

The whole island is opened for visitors and offers 3 km long trail at its northern end, used for recreation and for children education (with the help of rangers). During summer it is possible to cycle around the island perimeter, but after days of rain we were not able to even walk much further from the bridge.

On those 4 ha that belong to the NP a small nursery garden was established, allowing for cultivating and research of various genotypes of black poplar: "This was the original sort, but in the last 50 years it seemed to disappear from Hungary. (It was not interesting for commercial use because it does not grow as fast as new hybrids, there are more side branches that make it harder to cut, and there were more waste during processing.) Then, within the DANUB-EparksCONNECTED forest package, we had found the original black poplars here on the island and documented them by photographs and GPS points. We took genetic samples and sent them to appropriate institutes in order to successfully confirm that we have the right thing.

Thereafter, the LIFE program gave them a chance to establish another nursery with tens of different black poplar genotypes, while four hundred genotypes were collected along the Danube, in the territory of the NP.

Duna-Dráva National Park White storks on Black Poplars

I sailed through great sunny morning to the Danube bridge in Baja, a nice town with 37,000 souls in Bács-Kiskun County, where I met three botanists and rangers from the Duna-Dráva National Park - my cycling buddies for the longish ride to Mohács.

And it wasn't a straight way to there off course: how else would I be initiated into some secrets that usual tourists don't see? So, we forgot Mohács for a while and started with ride along Sugovica arm, to a sharp headland with the monument of famous Baja son, István Türr.

Back to Baja, and we crossed the Sugovica bridge to Petőfi island (Sugovica arm was actually the main Danube flow in the past). The island is a popular recreational and holiday area of the town, with a sports swimming pool, resorts and youth camps, many boat houses and places to rent kayaks or canoes.

One more jump, via a modern and beautiful pedestrian-cycling bridge over Türr István cut, and we landed on the Great Pandurian Island (Pandúr-sziget).

The Black Poplar was on the lips of many people that I met on this trip. A botanical icon, strong symbol of conservation and a usual wish in revitalization plans... But how to actually recognize it? Everyone seems to agree that genetic tests are the only sure way to tell it, but it also seems that in every protected area there is a special local receipt for that. (Or I just didn't listen to carefully all the time? ;)



"The shape of Black Poplar differs from modern, American hybrid (*Populus x euramericana* or 'Noble' poplar as we call it here) which has been planted in Hungary for the last 150 years. The Crown of the American type is more regular-shaped and its trunk its straighter (thus more convenient for cutting and that, together with the faster growth, makes it much more desirable for commercial use), while the Black Poplar has more 'freestyle' or 'disorderly' crown and trunk", says botanist **András Márkus** while briskly turning pedals of his mountain bike: „And there is also the look of the cross-section, of the core of a young branch: if it has a pentagon shape it is not Hungarian but the American type. There is, however, a presence of a genetic mixing, so the core method is not 100% reliable - that is why genetic test is the best thing to do."

"As American or 'Noble' poplars grow fast they are cut for commercial purposes every 20-30 years, unlike former hybrids that were cut every 50 years. If left alone, hybrid can live 80-100 years. As about the Black Poplar, if it grows alone and naturally its lifespan is 150 years, but if it was cultivated it can live 50-60 years.", explains **Tamás Schmidt**, the park ranger.

Duna-Dráva National Park was established in 1996. Most of its area (50,000 hectares, of which 19,000 ha are Ramsar wetlands) is located in one of Europe's largest and most natural floodplain ecosystem formed between the Danube, Drava and Sava rivers, son the Croatian and Serbian borders. The Danube is meandering here, carrying its sand and silt sediment and over time forming new side branches.

The fauna and flora of the area is highly diverse, with many species: there are populations of Black stork and White-tailed eagle, black hawthorn and the Drava caddis fly (both endemic to the National Park range), seven invertebrate species are unique in Hungary, while Drava habitats host more than 400 protected plants and animals.

Since this region near the southern Hungarian border has been inhabited since the early Bronze Age, through the history people adapted their life to the floodplain, using its resources. Farmers traditionally used narrow, natural or artificial, canals ("foks") to provide flooding of the inner land and to adapt it to their needs. Reed cutting, bee keeping and grazing, canal management... also were basis of the living here.

The protected species in this area of the Park are Black Stork, reptiles and amphibians. (And by the way, all reptile and amphibian species in Hungary are protected.)

In accordance with Hungarian regulations on flood protection, some zones have to be cleaned from lower vegetation, allowing water to flow faster during floods. However, from a botanical point of view it is good to have a lower plants growing between the trees in a poplar forest.

Removing aggressive plants (pale green trees on the photo above) is an never ending battle. The approach is usually not easy - and the Danube constantly brings new seeds anyway. (My hosts told me a nice story about the Szigetköz island that I visited some days before: during a flood that happened somewhere in the nineties of the last century, the Danube "stole" a huge amount of tomato seeds somewhere upstream and then unloaded most of it on the island. As a result, the Szigetköz was later covered with tomato plants for more than a year :)

While approaching Mohács we passed the side-branch that bordered the eastern side of Szabadság-sziget (Liberty Island). In 1983 a rock-fill dam was constructed here with the aim to embed drinking water pipes (while ship traffic would continue in the main river branch). But the dam stopped the continuous water flow in the river bed and that triggered fast sedimentation. It became obvious that during the time the side-branch would completely silt up and the island - one of the valuable habitats in the Beda-Karapanca region - would vanish into the river bank.



Rehabilitation of the Liberty Island

But thanks to the financial support of the EU LIFE+ program and to a cooperation of the public, NGO's and corporate partners, rehabilitation project was carried out in the period of 2009-2013. The dam was opened and the sediment removed from it, while at the same time aggressive invasive tree species on the island were replaced with native ones. This not only saved the precious habitat but provided better drinking water quality and allowed local people to use the side-branch again for recreational purposes - canoeing and rowing.



Here we see a micro-location that has been protected due to black storks nesting. But that protection also saved poplars from regular cutting so they had a chance to live their full lifespan. Material for the embankment was dug in the forest, which left many small ponds that now prevent the approach of machines. The consequence of all this is that the zone is more natural and more diverse.

With Eszter Buchert, talkin' storks and other nice things

I said goodbye to the guys in Mohács and continued downstream through Baranya county, to the new house of the Duna-Dráva NP, on the outskirts of the village Kölked.

The house was freshly built this spring, within an EU project. And that is where I met Mrs. Eszter Buchert, vice-director of the NP.

"We currently use a small rented office in Mohács, and this house will finally - as its primary purpose - provide enough space for researchers. But our White Stork Museum is presently located in a former school of Kölked which does not belong to us - that's why we plan to build another building next to this one and to move the museum here."



There is a nice accommodation space in the house of the apartment type (and I happily used it overnight), but will it be open for tourists?

“No, the house will not compete with village capacities. The local people should realize that they can make a real income from agro tourism, so they certainly should benefit from our visitors as well, especially because this kind of cooperation with them is slowly developing. Motivation is a problem (along the Drava it is even worse) and since 2010 only one household decided to offer pension service in the village.”



The White Stork Museum in Kölked

We went to Kölked to visit the White Stork Museum (Fehér Gólya Múzeum), created in 2001 by the Kölked municipality, with the support of the Duna-Drava NP Directorate. The museum exhibition educates visitors about various stork species, their life and migration routes.

At the first place, why is there such a museum, unique in Hungary, exactly in this village?

“Kölked is a village of storks – even if it is a small one, there are 17 nests and storks are truly the citizens here, they are living with the village for centuries. Storks naturally live in forests and flood plains, but as such areas have been constantly reduced over time, white storks moved closer to settlements, discovering that they could find more food there and that humans are not a danger to them. (Other inhabitants can be a bit different story though: storks typically do not visit yards with dogs.) Black storks are more suspicious and they still like to live far from us. Living with us, storks have learned to use opportunities. For example, during harvest time or when grass is cut on fields, they go in front or behind machines, searching for bugs or mice.”

Like a snack bar... But we also benefit from them, I mean that birth rate thing...

And when we are at it: where that legend of distributing and delivering babies comes from?

„Throughout the centuries most weddings happen in autumn, when field jobs are finished and there is more free time. Accordingly, a lot of children are born in the spring, which is also the time when storks reappear, returning from the south. But probably most poetic explanation is the one that speaks about souls of yet unborn babies levitating in wetlands: when storks stroll around they luckily pick up a soul here and there, dropping it later (also luckily) on somebody’s home. “

Poetic it is... But it seems that we started this visit from the end instead from the beginning - let's talk about the group psychology and mental focus of storks?

“Um... let me give to you this concise guide to the Museum exhibition – you will find there a lot of interesting things about storks”

And here it is:

More nuts and bolts of the white storks (as learned from the Museum guide)

- Based on migration routes, the nesting population of storks in Europe can be divided into two groups:
 - Storks nesting west from the river Weser in Germany leave Europe through the Gibraltar Strait in their journey towards Africa, and migrate to the north-eastern part of the continent. (10% of migrating storks)
 - Storks spending their breeding period east from the Weser river travel through the Bosphorus and follow the Nile valley in their journey to their wintering sites further to the south on the continent. (90% of migrating storks)
- Storks leave Hungary in August, or in the middle of September as latest, and continue to glide 200-300 kilometers a day towards the south for 2-3 months, helped by warm air currents. They interrupt their journey at specific locations to rest and feed. At least 15 such places are known to exist on the Bosphorus route. On the way back, the flight takes much less time, sometimes only 1.5 month, as storks are in a hurry to start breeding as soon as possible.
- White storks return home in springtime, somewhere around March, and the male bird arrives first. He chooses the nest and starts to renovate

it. And even the bird world is not immune to the material values in life: it is not the beauty of the male bird that attracts the female, but the nest that he is offering.

- To additionally increase the comfort of life, storks rent the surplus space (the bottom parts of nests) to sparrows. These little tenants clean waste material.
- In ancient times storks used to nest on cliffs, then turned towards treetops, later to roofs and chimneys, and recently have preferred electric power poles which now hold about 90% of stork nests in Hungary. Because these poles can be dangerous to the birds, electricity companies have been installing elevated nest platforms since the 1970s.
- Other preferred nesting places include water towers, church towers and satellite receiver dishes.
- White stork nests contain twigs, hay, straw, roots and feathers. But technologically advanced materials are also used, such as bale strings or plastic bags.
- The weigh of a nest can reach 50-100 kilos. The heaviest stork nest ever known weighed 2000 kg!
- The female lays 4-5 eggs that are incubated for one month. The chicks need to grow fast during a short period of time and each day they consume the same amount of food as their own body weight. The parent birds regurgitate the prey into the middle of the nest from where the chicks help themselves. Only water is delivered bill-to-bill.
- At the age of one month the young birds stand up, and by the time they are 2 months old they are about to leave the nest. Young storks that already fly always return to the nest for the night.
- The bill and feet of young birds are black. Then they gradually turn red as the bird become older - the older the bird, the more intensive red its bill and feet are.
- Storks reach their maturity and start successfully breeding when they of 3-4 years old. Before that they only have breeding attempts and travel around a lot.

- The oldest known stork that had been ringed lived for 19 years and was killed by electrocution. However, there is written information about a stork that is said to have lived for 70 years - this one was kept in captivity, with food and shelter always provided
- Hungary has two native species: the white stork and the black stork. Both are strictly protected.
- Storks are mute. But they can emit sounds by repeatedly knocking together the upper and lower halves of their bills ("bill-clattering").



There is even one permanent member of the stork population in Kölked: the name of this girl is Pipacs (Pipach, i.e. "Poppy Flower").

Four years old now, she fell from nest when she was fledgling and since then was never able to fly. That's why she stays here all year long, and that is okay: what forces storks to go migrate to the south are not low temperatures in the winter, but the lack of food at that time.

Since last year there is even a potential groom that comes to visit regularly, but she still refuses him:

"Pipach probably doesn't like that he is straying around quite a lot, being quite a Casanova", smiles Eszter..

Pipach: no intention to try her wings

And all others that migrate... Where exactly do they go?

"Storks in our Park migrate to Victoria Lake in Africa. We know this thanks to a marking that began in 1908, first in Budapest area before spreading to other parts of the country.

Markers are aluminum rings with unique numbers, applied on the left foot of the bird. (Coloured rings are also widely used nowadays, since these are simpler to read and identify. And for continuous tracking of the birds on their journeys, electronic transmitters are used.

The number (or color scheme) from the marker, with recorded position of the bird, appear on the "Bird Life International" website whenever some of their associates and volunteers across Europe and Africa spot a bird with a marker."

What is a message sent by the model of the Kölked's environment, what is the essence that the visitors should learn from it

"A deep and complete knowledge of a flooding area is necessary before attempting any changes in it, in order to be able to predict how that particular change would influence the whole system. For example, a certain change in water management can lead to draining ponds in the area, and that will form a longer chain of other elements of the habitat. No ponds - no frogs? What will then happen with storks? If there are fewer storks to help regulate numbers of bags and mice, will that reflect on agricultural results and food yields? Engineers and planners should not focus only on technical side, they need to look at a complete picture."

Any other activities and services of the museum that we should mention?

"We are very proud to have a regular painting contest for primary school children once a year. It is already well established tradition."

The Museum also offers a bike rental service. There is a choice of mountain bikes - we believe that they are most suitable for this area - with different sizes, including those for children."

We went to check recommended route for cyclists that takes them deeper into the Béda-Karapanca (Karapanca = "Black water") - the zone with most densely populated white-tailed eagle and black stork areas in Hungary.

The tranquility of barely touched forests is also shared here by herons, egrets and spoonbills. The shallow pools and water bodies serve as nurseries for the growing young fish and there is abundant food for these as well as for a multitude of other wading and water birds. Plants species are those of marsh meadows and pastures.

Hapsburg nobleman owned the entire region from here to Osijek in Croatia and to Bačka Palanka in Serbia. Agricultural land, fishing and hunting reserves... all that was private and closed for public, which helped to preserve Béda-Karapanca.

The whole cycling route is 40 km long and can be done in one afternoon, but for the best experience it is recommended to take it slow - a full day or even to two days would be optimal.

There was a discrete fence below the dam that we used: "It protects young trees and fields from wild boars and red deer. Also from beavers, which were reintroduced in 1996 from Austrian National park Donau-Auen. There is a bit too much of them now..." says Eszter. Before this and other similar fences were implemented, the damage caused by animals amounted to more than 300,000 EUR per year.

Do you think about re-introducing beavers (let's say a couple hundreds of them) to the Donau-Auen?

"Beavers live maximally 50-100m from water", educates me Zoltán politely about a different point, while giving me a strange look at the same time.

In the meantime, we passed by his fairytale-like house right in the middle of the forest. His family breeds domestic animals (pigs mostly) but also offers accommodation for tourists and guests - Zoltan's wife usually guides them around. The old and nicely renovated house is rated by three sunflowers, proudly shown on the facade: there is a national system to classify agro-tourism capacities in Hungary, with maximum four sunflowers for top facilities.

Next was Lake Boki, nice fishery and Visitors Point: "We organize four hours long tours for 10-40 persons, most often primary and high school students but there is also team building. Participants come from abroad as well and we even had a group from

Portugal. Capacities are limited to 20 groups per year - each tour demands a lot of preparation work", explains Eszter.

We reached the far and lonely part of the dam close to the border line with Croatia (as indicated on our GPS devices, but also by a border police patrol that we met) when fence took a completely different look: it was no longer intended for animals but for illegal migrants.

But yet, animals are often its victims. Rangers often find here blood stains or traces of fur, or even dead roe deer - they get hurt or die while trying to leap over. "On top of all that, this fence can be quite easily resolved by humans", grumbles Zoltán, "It is enough to throw over it a young trunk or a stronger branch, and than one can use it to walk over." (*)

(*) I wondered would it be appropriate to publicly mention this "recipe", but it is actually quite unlikely that someone who risked its life and used all possible ways and tricks to reach this point, wouldn't quickly come to the mentioned solution.



These countless, razor-sharp double blades will mercilessly cut everything that comes to them. Including the enthusiasm for Europe without borders.

The perfectly nice paved dam continued towards the east, representing the shortest, and nicest way to cycle to Croatian town Batina. But that part will stay out of cyclists' reach until Croatia enters Schengen zone. In the meantime, the EuroVelo 6 route goes to Batina by the main road from Mohács and via the official border crossing Udvar.



The Lábasház ("House on legs"). This former control station for the Iron Curtain now belongs to the city of Mohács and offers accommodation for 50 persons. Not very far from here there is a canoe station established by the NP ten years ago. It offers paddling experience for as much as 45 people (the canoes are dimensioned for 4 to 7 persons). Tours take 1.5-3h and participants arrive here by bus.

This magnificent and obviously expensive bicycle station right below the dam, offers showers, kitchen, and a large covered space. It was built in the frame of a Hungary-Croatia IPA cross-border project, co-financed by the European Union. But it is located in the fenced courtyard of a Southern Transdanubian Water Directorate (with the head office in Pécs) and an info-board at the entrance explains (only in Hungarian) that the station is intended "for organized bicycle groups, and only

with previous announcement one week before arrival." As that looks a bit complicated and the number of requirements is probably low (close to zero?), the Directorate officials are unwillingly forced to use the station as a holiday escape for themselves and their families.



Talking with Eszter, part two: history and nature conservation nicely going with each other

My last visit in the Duna-Dráva National Park was to the Mohács Battle Memorial. The battle took place in 1526 and it was fought between the forces of the Kingdom of Hungary (25,000 to 30,000 soldiers led by King Louis II) and the forces of Ottoman Empire (50,000 to 100,000 soldiers led by Sultan Suleiman the Magnificent). It marked the end of the Middle Ages in Hungary, and by its consequences was one of the most important events in Central European history. Hungarians were defeated, with death toll of 14,000 to 18,000 and Louis II among them. (He died in a peculiar accident while leaving the battlefield: after being thrown from his horse in a river and drowned, weighed down by his heavy armor). That ended the Jagiellonian dynasty in Hungary/Bohemia while its legitimacy has been transferred to Habsburgs. The Kingdom of Hungary was split between the Habsburg Monarchy, the Ottoman Empire, and the Principality of Transylvania.

Several kilometers south of Mohács we turned left from the road to Udvar border cross and just before village Sátorhely ("The space for tents" - this name probably also came from the time of the battle?) we stopped in front of an isolated building with interesting architecture. "It symbolizes the Hungarian crown", explains Eszter.

"The exact place of the battle was not known, despite some excavations that took place in 1961. And then in 1970 some bones came out to the surface during field works. People from the area collected them and preserved them from stealing.

The zone was soon declared as a Protected Area and the memorial park was constructed over the medieval graves - the last resting-place of more than 1700 soldiers. It was at first managed by a local Tourist organization and then by the Water managing company. Our National park was established in 1996 and since then it also manages the Memorial complex.

The main building with Visitors Centre and exhibition space was constructed in 2011, which was made possible by a large EU funded project. At the beginning the Memorial had status of a historical monument, but it was later declared as a National Monument, one of thirteen that we have in Hungary."

It seems that the strong historical background also helped to protect the nature here?

"This was actually the only way to permanently protect the zone."

Each and every element in the complex, even the smallest ones, bears a special meaning. Above the three parts of this marble flower symbolize the split of Hungary after the Mohacs Battle. But there is water that flows in the gaps between them: that is a symbol of Christianity as the force that will connect the country again.

The battlefield is represented by a huge circular lawn with concentric circular paths which represent the continuous wandering of human beings through pain and suffering. But out of these paths, at the farthest part of the battlefield, there is a large cross - the only way to break circles and to end the wandering.



Even this breach in the forest surrounding the battlefield is not accidental: it marks the direction from which the Ottoman army came.

We were there on a bad, rainy afternoon so the place was empty. And I can't imagine any other chance to hear a feeble reverberation of what was happening here on that day, ages ago. Because it was the silence of the field, sown with these strange, distorted wooden sculptures, that brought to us the terrible noise of the battle. The fear and suffering of the dying horses who, in their last power, are vainly trying to resist the blood-soaked soil that pulls them in. The screaming of steel. The hard sighs of flesh that accepts its fate. The quick flashes of heroism and cowardice, most of them not seen or remembered because everyone is busy with either killing or dying. Figures of Louis and Suleiman, deeply wrapped in their roles. And after the battle - a lone mother searching for her sons.

There is a small wooden belfry where you can pull the rope and swing the bell while thinking of the dead. If there is a sound all these memories are not yours, and you are alive.

(after a while)

Going around here was a strong and touching experience. And we could say that people should visit the Memorial and feel it for themselves. But speaking of visitors, do you see cycle tourists here?

"Actually not. And when we ask those who travel along the EuroVelo 6 why is that, the typical answer is that they didn't know about the Memorial. There is not enough information about it in cycle tourism circles and it is especially missing in the European cyclists' federation online media which is, of course, the most consulted source when planning or traveling along the EuroVelo routes."

For a bit more personal picture at the end... I see that you are passionate about your job and about the National park in general. How long do you work here?

"After my Biology and German studies and after a career as a secondary school teacher, I came to the NP in 1998. In the beginning I was working on monitoring species and habitats, but from 2004 my focus went to eco-tourism and nature education. I made a concept for opening the Park to the society, then was part of the management during the (huge) Memorial Center project and worked on the concept of the Memorial center building and as well as on Visitors guiding concept. The results of these last activities made me specially happy.

But are there things that make your work harder than it should be?

"There is always something. Until 2010 we had separate Ministry for environment and nature conservation, with its own secretary. But it was then merged

into a department of the Ministry of agriculture, despite the fact that the basic interest of such a ministry is not compatible (and actually often threatens) nature conservation. And even that was not the end: a bit later, 40% of employees from the department for nature conservation were fired. That makes efficient supervision of plans, projects, and actions of the agriculture industry very difficult, if not completely impossible. All that at the same time when - as stated at the Paris Biodiversity conference - current number of endangered species is one million, and we get a clear message that our world has a chance only if industry and economy worldwide change and adapt right now, without delay."

The DANUBE parksCONNECTED experience?

"Through that project I became really aware of various cultures, different life styles along the Danube, aware that there are different backgrounds and history... But also that the Danube is powerful enough to glue all this variety into one unit - the river is the core of that connection.

During our sub-projects I had a chance to visit almost all the partners and felt that our personal contact has been constantly developed and improved, and that a very good team was formed. (While saying this I can't help but to particularly remember of the Donau-Auen people, Georg Frank and ex-director Carl Manzano, who motivated everyone with their passion and charisma.) After so many years we know each other very well, I mean even personally: when you need something, you can write or call ... but when you actually have met the person on the other side and you know his or her face and gestures, that's more than a formal electronic link. We are a bit like a large family and that makes our network more prepared for even more ambitious ventures in the future. And this is not something that is routinely achieved: while participating in some other international projects, I sometimes miss the special atmosphere that we have here.

Kopački rit Nature park Visiting a pustara, revealing who is burning poplars

Traveling through Croatian part of the Baranja ("Baranya") - a region between between the Danube and the Drava that is shared with Hungary - I arrived at Tikveš castle early in the morning, enjoying the quiet charm of its large park.

The castle is actually a complex with two buildings and service facilities. It was built in the 19th century by the Teschen line of the Habsburg family, to serve as a "head office" of the imperial hunting ground. After 1918 it had the same role for Karađorđević dynasty members (who built the main edifice in the thirties of the 20th century), then after the World War II Josip Broz Tito was the one who enjoyed it - at that time the castle saw many world politicians and celebrities who stayed here as his guests. Today the whole zone is a part of Kopački rit Nature Park.

During the war in Croatia, the castle was robbed and devastated. It was slowly decaying after that, in the middle of its forest full of wildlife and under its blanket of the rich history - until the recent renovation.

There is a bio-ecological station in the castle and that's where I joined a group of local cycling aficionados. We even have one hand driven tricycle and I will share with them a ride to village Tikveš and behind it, along the very edge of the rit. ("Rit" - pronounced as "reet" - is generally wetland, but its more precise meaning is "reed beds". It is the most usual expression in Croatia and Serbia to denote river wetlands and flooding areas, thus there are many rits along the Danube in these countries.)



After exiting the forest, we were riding along gravel road on the dam. At our right side there were meadows, while hundreds of green shades sprinkled with blue strips on the left side denoted the magic kingdom of rit.

"The dam - or 'bent' as we say - is for protection from the Danube", said **Mr. Hrvoje Domazetović**, a ranger in the Park, member of Croatian mountain rescue service and our guide.

"We are here all the time within borders of the Nature Park, but the zone at our left side - from the dam towards the Drava and the Danube - is a specially protected area, with the level of protection equal to one in a National park: no economic or commercial activities are allowed there, everything is left to natural cycles. Tourists can visit the rit only on specially built boats and escorted by our guides."

We soon passed through the tiny settlement Tikveš that silently lied in the middle of the steppe, so-called "pustara" (meaning "empty, lonely space").

"Pustara" is by definition a spacious land that is not being cultivated but serves for cattle, horse and pig breeding in the open. The name probably came from the Hungarian word "puszta", which usually translates as a "spacious plain". (An interesting twist is that "puszta" itself quite obviously came to Hungarian from Slavic languages where it means "lonely", "bleak").

However, the same name was also used for planned settlements, founded as early as the 19th century (during the Austro-Hungarian period) in the regions of Slavonia and Baranja and intended for accommodation of workers at the surrounding large agricultural estates of Belje. Each pustara was also an administrative headquarters for each of these estates.

Pustaras were like islands in the sea (of forests) or like oases in a desert (of grasslands). Being planned, all of them were basically the same, composed of three parts: a central administrative building, economy facilities around it, and a series of uniform buildings with lodging for workers (long units with six one-bedroom apartments for six families, or classic small houses).

And perhaps the best description of pustara was given by one of their inhabitants: "Living here means living in a large family where there are no secrets, in which everyone knows you from your birth, everyone lives with you, and you live with them."

There were a lot of pustaras in Slavonia and Baranja, some of them even with thousands of inhabitants and with infirmaries, cinemas all other conveniences. But they have been slowly dying for a long time now and there is none left in Slavonia now, while in Baranja there are still a few, barely inhabited:

"Nowadays they quickly tear down the old settlement, clear the space and then build there a modern farm with a crew of 2-3 persons - one of them inevitably a computer specialist - that can take care of 2000 pigs for example", sighs Hrvoje.

In the zone of Kopački rit there were four pustaras. Tikveš settlement is one of them. Inventory list: ten or so permanent inhabitants, two dozen buildings (most of them abandoned), a narrow road coming from The World and turning into the only street of the settlement before it ends at its opposite end. After that, there is only the forest. Water from a well, no shops. And that's all. Oh, and wild boars are patrolling yards in the night.

With the total area 23,000 ha, the triangle of Kopački rit between the Danube (in the east) and Drava (in the south) is the largest internal delta of the Danube, and also one of the largest alluvial wetlands of Europe.

If NP = National Park or Nature Park, and PA = Protected Area, then PG = ?

Just a couple km after the entrance to Kopački rit Nature Park, one enters the nice little town Bilje. And like every other little town, it has a graveyard too. But the Bilje's graveyard is unique: its area of half a hectare is a precious phytocenose, the only remaining steppe-like meadow in Croatia. There are 140 plant species there, some of them rare and endangered. That is why in the year 2000 this space was declared as a Monument of Nature. It is especially beautiful in May, when blooming narcissi explode into a white carpet.

It is extremely important as a spawning area for freshwater fish. There are 2,300 biological species in the Nature Park, many of them rare and endangered at the global and European levels. And it is an ornithological heaven, with about 140 nesting bird species - the most in all of Europe.

These are reasons why the Park is listed as an Important Bird Area (IBA), since 1993 as a Ramsar area (Wetland of International Importance), and since 2012 as a part the Mura-Drava-Danube Transboundary Biosphere Reserve (established by UNESCO).

"Plus, it functions as a safety valve during floods, 'swallowing' the surplus water. Without it, towns and other inhabited areas of the region would have been in trouble many times in the past. In Austria, the fall of the Danube is 40 cm per kilometer, while here it is 20 cm per kilometer. Therefore, cutting this dam and building a new stretch of embankment to protect the important places in such a wide area would be very expensive: instead of the constructing an "L" line towards the Danube flow, the embankment would have to form a full semicircle towards the river (like when enclosing a fishpond)."

The topology of Kopački rit is a result of two forces: constant flooding creates many ponds while sedimentation elevates the soil around them (the terrain rises 1-5 cm per year), creating a magical maze.

In the organizational sense, Kopački rit is a nature park that contains a strict (special zoological) reserve of 7,000 ha in its hart.

As we enter more in the wetland, poplars disappear and willows become the only trees around. "That is because the willow is the only tree that can survive in the water up to three months."

Hrvoje passionately turns to as: "When water is high, there are floating nests. Then there is the time for fish to spawn. Then the autumn brings the roar of deer. The rit is changing a lot with seasons and even in mid-winter, it has a different sort of beauty to the summer. Old trees and eagles make you be aware of the power of nature, there is a chance to see foxes, coyotes... That's why I think that it is more beautiful here than in the Kornati (an archipelago of small islands and National Park in the Adriatic Sea, Jovan's comment) - in 13 years that I have been working here, not a single year was the same for me."

Our ride ended at the entrance to the village Kopačevo, in front of the Visitors Centre. This point is also the start of an amazing labyrinth of elevated wooden boardwalks which allow visitors to closely experience the atmosphere of the rit. (The only other chance to do the same is by boat cruise.)

"We sometimes have as much as 1000 visitors per day", says **Tomislav Bogdanović**, the director of the Nature Park. "And on a yearly basis we have 40,000 guests on average. But now, when the Tikveš Castle is ready to accept tourists and to offer them several different services, we will have even much stronger position and expect to have up to 100,000 visits per year."

What about cycle tourists - do you have any significant visit of that sort, having in mind that the Park is positioned directly on the route EuroVelo 6?

Last winter we installed a cycling counter nearby. It shows a minimum of 100 visitors on two wheels during weekend days, 20-25% from that number being foreigners. However, on average one foreign cyclist visits the Park per day. We plan to attract more visits of this type by increasing accommodation capacities in the village, which will encourage guests to stay here. Except for the ecological value of cycling, our interest also lies in the simple fact that an increased number of cycle tourists will also grow strong the Park image. Furthermore, we want to have a complete tourist program here.

We believe that we have the best preserved flood valley along the Danube, spreading on 15,000 ha. A strong indicator for that is the population of the white-tailed eagles: there are constantly about 60 pairs of them and the total number of individuals is about 200. Also, the width of Kopački rit is remarkable: up to 11km from the river to the embankment (like exactly on this place where we are standing now). At some places the span from the beginning of the wetland on this side to the end of the wetland on the opposite side of the river is 18km. (The rit on the opposite side is Gornje Podunavlje Special Nature Reserve, and in between is the border of Croatia and Serbia - but for birds and fish it is of course a unique space.)

The core of the Kopački rit is its special zoological reserve that spreads on 7,000 ha, and only scientific and educational activities under the supervision of the Park are allowed there. That level of protection in an area of such size does not exist anywhere along the Danube."

Speaking of which, what is the system of nature protection in Croatia?

"There are:

- Strict reservation;
- National park;
- Special reserve (which in practice has higher level of protection than a National park; Lakes Plitvice for example are an National park, but contain one Special Reserve too);
- Nature park (the level of protection in an Croatian NP is equal to one in a Hungarian or Serbian national park)."

Are you satisfied with the general position of the Nature Park?

At a larger scale one can note that the average level of public and bureaucratic awareness regarding nature is still not completely satisfying. But since the independence of Croatia the nature conservation sector has been steadily strengthening and legislature follows that trend. Natura 2000 brought the final touch on top of that, and we don't have to worry anymore that, for example, someone might build a weekend house in a protected zone, wherever that zone is located.

There is also a significant and steady increase of income (and absolutely, of visits) in national parks and nature parks in Croatia. We have good cooperation with those with whom we share this area - forest, hunting and water management industry.

The tourism in Kopački rit has been developing strongly in the last 5-6 years, which is linked to the development of infrastructure - the most influential step in that process was the construction of the 2,5 km long network of elevated boardwalks in 2015.

So yes, we can say that we are satisfied with the situation."

I also had a pleasure to spoke with **Mr. Vlatko Rožac**, a Conservation Manager at the Park and also the President of the DANUBEPARKS' Board of Directors.

"It is our third project in the frame of the Danube-ParksConnected. We were observers in the first one and in the second and third one we participated as partners. Besides other project activities, that gave us a chance to visit all partners so far except Persina Nature Park, and the exchange of knowledge and experience was extremely valuable."

Vlatko puts one of the most important rules of the Kopački rit Directorate into a single line: „Visitors - yes, but the protection of nature is in the first place."

A fascinating thing is the fact that Kopački rit is flooded on an average of 99 days a year, while the entire area is under water for an average of 32 days. And there was an interesting detail about the mechanism of the flooding process:

"The change of the water level in the rit is mostly dictated by the Danube, despite the fact that the Drava is at some points only 300 m away. When the Drava grows this single event doesn't change the Danube water level. But when the Danube grows it slows the Drava and increases its water level upstream from the mouth, while at the same time the Danube already fills the rit. That's why the Drava affects the water levels in the Kopački rit by only 10%.

And the level change can be very fast: it happens sometimes that the Danube rises two to three meters in one day and then drops overnight, leaving fish on dry land at some places."

And the last info for me before enjoying walking on the boardwalk:

"Boundary of the Nature Park is the embankment, so technically the boardwalks are not part of the Park. But that is just an administrative curiosity - the important thing is that the zone where they were constructed was carefully chosen because it shows, in a small scale, all typical habitats of the rit."

The best part of the visit was left for the end: I boarded the boat with **Damir Vuletić**, park officer and an expert guide, and headed for the heart of the rit.



Swans in their large nests can be also nicely observed from the boardwalk.

"A huge part of that heart is actually an island with the area of 5000 ha, separated by the 15 km long channel Vemeljski Dunavac. This and other channels compose the inner 'bloodstream' of the rit and also connect it to the Danube and the Drava. The two rivers bring some unwanted "gifts" from the civilization into peripheral zones of the rit, and that requires intervening. For example, we recently engaged 40-50 workers to clean the Vemeljski Dunavac from plastic bottles and other waste. Such actions are carried out in periods of low water so that a location can be reached by land."

With thousands of birds and shiny blue skies above the Kopačko lake, it looked that we landed somewhere in Africa. There is an abundance of fish here: pike, perch, bream, catfish, rudd... almost 50 species.

"We also have coyotes here - two or three packs are sniffing around lately", adds Damir.

Symbol of the park is the White-tailed eagle, one of the largest in the EU (with the wingspan reaching more than two meters) and a true athlete: with an average weight of 4 kg, he can pull up from the water a fish whose weight is twice as big as his. (The eagles of Kopački rit feed on fish and don't need to pay much attention on other birds.) White-tailed eagles live as couples and stay with their partner for a lifetime. They typically nest in oak forests but also on willows, and constantly upgrade their nests so some of them can reach the size of 3 square meters and 700 kg of weight. And there is no mercy in an eagle's household: the strongest youngster will throw his brothers and sisters out while the parents are absent.



.... And goodbye to this magnificent page of the magic Danube book!



The cormorants of Kopački rit

There are about 1000 couples of cormorants in the Park. These birds can dive to a depth of up to 9 m and eat about a half kilogram of fish a day. That is a ton of fish every day, and this fact actually illustrates how abundant is the fish world of Kopački rit.

An uninformed observer might think that cormorants like to swagger a lot, but unlike other wading birds they actually do not have sebaceous glands and can't lubricate their feathers to make them waterproof. Instead, they have to dry them after diving - that's why you see them so often with their wings spread and 'posing' on branches. Another popular activity of cormorants is to 'burn off' the poplars on which they nest - that's actually what the acid from their excrement does."

FRUŠKA GORA NATIONAL PARK In the realm of the forest

After a long drive at the bottom of the endless fertile plain that used to be the bottom of the Pannonian Sea, one cannot but notice the long, green ridge on the right side of the Danube that is slowly rising in the direction of Novi Sad. That is Fruška gora, an 80km long low mountain. (Today. But for 9 million years it used to be an island of the Pannonian Sea.)

Novi Sad is the second-largest city in Serbia (which doesn't mean it's big, having only 250,000 inhabitants), and while it is debatable that its main summer attractions - sunbathing on the city beach and sweating at the Exit festival - were as good 20 million years ago as they are today, one thing is sure: Sremska Kamenica, its suburban settlement on the right bank of the river, is the seat of the Fruška gora National Park Directorate.

„Gora“ is an old Serbian word for mountain, while „Fruška“ comes from an old Serbian word for Frankish people - „Frankish mountain“ indicates that the Franks (who would say that) inhabited or controlled this area while clashing with the Roman empire. Roman name for it was Alma Mons, the “fertile mount” where first grapevines were planted in the 3rd century of our era, during the reign of the emperor Marcus Aurelius Probus (born in the nearby Sirmium).

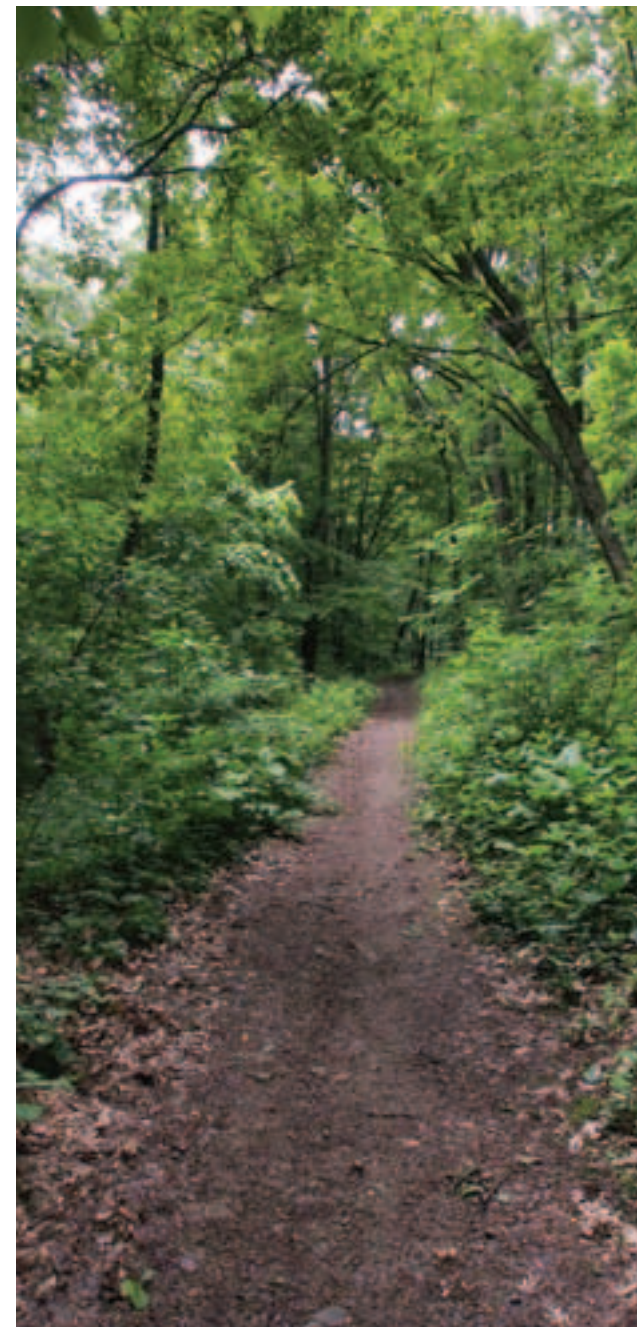
The mountain is a natural geological phenomenon: it is built from the rocks from almost all geological periods of the Earth. And the National Park is an administrative phenomenon: it might be the largest missing

child of the DANUBEPARKS brotherhood. But while it is not a member yet, due to its size and importance, as well as its inevitable future membership, it couldn't be skipped.

So I headed to the main office in Sremska Kamenica, and they then quickly took me up the brutal mountain whose summit was at a deadly altitude of 538 meters above sea level. Ok, “brutal” and “deadly” is probably a bit exaggerated if you can set yourself a limit at how much you should drink while visiting many wine cellars there. A (psychologically) important thing to know is that Fruška Gora divides the wide region of Srem into two geographically distinct parts: Wine Srem (upper or mountainous) and, well, Pork Srem (lowland). But to imagine ascending to Fruška gora as an escape from a geologically newer but smelly Pannonian sea of pigs, would be totally wrong: locals say that there is just enough pork meat around to boost the pleasure of wine :)

The first person to meet and talk to was **Mr. Konstantin Plužarević**, an Assistant of the Director for Protection and Development:

“The national park Fruška Gora was declared in 1960 and covers an area of 267 km². This territory comprises 8 municipalities and 44 local communities and obviously is exposed to urban pressure. There are more than 14 paved entrances to the Park, plus there are many other field roads that also enter the Park. The traffic on some of these roads is heavy, especially on the road M21 that comes from the town of Sremska Mitrovica (the historical Sirmium) with over 20,000 vehicles a day. On other local roads there is an average of 2000 vehicles in 8 hours. There is a road that goes all along the 80 km long ridge of Fruška Gora ridge, It has been reconstructed (re-paved) at the first part and now Regional Development Agency Srem is preparing technical documentation project for next



reconstruction phase. It is nice to have such a good basic infrastructure in the Park, but we must maintain control over its consequences.

Very important for us is a planned tunnel that will go under Fruška Gora, in the direction Novi Sad - Belgrade. Technical documentation is already done, and it will crucially reduce the traffic pressure on the whole mountain."

The Park is not a member of the Danube Parks. Why is that?

"For 60 years the Park was managing the part of the Danube from Bačka Palanka to Beška, in the length of 64 km. We were first in Serbia by the number of fishery staff and carried out a detailed control of fish and fishing in that section, managing to remove and confiscate up to 120 km of illegal fishing nets annually.

However, that section of the Danube was recently awarded to the state company "Vojvodinavode" for a 10-year period. Vojvodinavode manages most of the flora and fauna along the Danube in the Vojvodina province, but this was a serious blow to us - among other things, as the National Park was extending along the Danube, we planned to connect with the DANUBEPARKS association on that basis. Now we are a bit isolated from the Danube and this plan will stay on hold for a while - we first have to get back our part of the river."

The dense forest that covers Fruška gora is really impressive

"Next year we will celebrate 60 years of the Park. We started from 2.5 million cubic meters of timber and now we have more than 6 million - mostly lime trees and oak. But the Park forest estate is generally too old. Many think that it is economically viable, but nursing measures are in some areas more expensive than the economic benefits of those measures.

We actually consider lime trees an aggressive species because they occupy oak habitats. Not every type of land can provide the quality that oak requires - a deep soil and plenty of food. (While pine, for example, thrives on shallow soils with little food.)

And one has to be careful when trying to improve the situation as system errors are only visible after a long time, e.g. after 120 years. An example with pine trees: they were planted all over the former Yugoslavia during popular and massive public volunteer work actions - but it wasn't the sort suitable for all parts of the country. And being "not suitable" can mean a disaster: a few years ago, storm in the High Tatras brought down 75,000 ha of spruce in just one night, because its root system was too shallow.

There are quite a lot of deer here?

"Ten years ago we reintroduced the European deer (*Cervus elaphus*) with specimens that we got from Hungary. This species has vanished in the region but now we have more than 300 individuals. We even gave some of our deer to other parks and protected areas in Serbia, while the rest have been released into the area around the Ravne Eco-Center.

The Eco-Center is housed in a villa built in the late 19th century by Count Arturo Odeskalski. After World War II it became state property. The roof was damaged during the 1999 NATO bombing and collapsed after that. We are negotiating with the Government of the Province of Vojvodina on the transfer of the villa to our property, and want also to returning the rest of its original inventory (which is presently also stored in Government warehouses).

Our mouflons and Fallow deer are allochthonous species here, they have never lived on Fruška gora. Despite the fact that we have had mouflons in the Park for many years, no genetic refreshment of their population has been done. However, some time ago we received 30 new specimens from Slovakia.



The tree sorts of Fruška gora

We are currently in the final phase of bringing a family of the European Bison (*Zubr* or *Visent* / *Bison bonasus*) from Poland. Bisons will be an attraction and will live in a separately fenced area.

A problem that I would like to point out is that our wildlife sometimes manages to get out of the Park and then easily falls victim to local poachers. (We don't have poaching in the park.)

Fruška gora is not only wildlife and forest, there also are man-made attractions here?

There are 17 monasteries here, that is why the mountain is called Mount Athos of Serbia. All the monasteries are formally outside the Park borders, but a total of 6000 ha of their forests are located in the Park and we manage them. (Despite the fact that these forests, which were nationalized after World War II, were formally returned to the monasteries three years ago.)

There are 14 lakes in Fruška Gora and three more are located along the wider mountain zone. All of them are artificial, formed in the 1970s and 1980s with the aim of preventing the flooding of arable land while ensuring its irrigation. Three lakes (Sot, Bruja and Moharac) are within the boundaries of the park. The rights to manage these lakes are granted through public competitions announced by the state.

We have a mountain marathon that has been held in Fruška Gora for 42 years now, and there is a cycling marathon for the last couple of decades. (Trails for both of these sports also partially run across the monasteries lands.)"

Some more planned development in the near future?

"The Park has a buffer zone along its real border and we try to take care of that part too. The State Institute for Nature Conservation is currently working on a study that would put the Beočin Road - one of the roads that climb to Fruška gora from Novi Sad's side - under protection."

My next conversationalist was **Mr. Dragiša Savić** - a biologist, nature protection and flora&fauna improvement officer in the Park

"Fruška Gora does not look like a protected area that provides great biodiversity - it is only 500 me-



Dragiša with a typical info-board for hikers

ters high, barely qualifying to be a mountain. But this mountain refutes the theory, for several reasons.

At the first place, the location is crucial for biodiversity because the mountain is located on the edge of the vast plain where four geographical areas touch: Pannonian, Moesian, Illyrian and Dacian. Each of them has their own set of living things, but here we have each of those sets.

Secondly, while due to its small height Fruška Gora could be mistaken as a geological "teenager", it is actually over 300 million years old. The composition of the soil is dominated by limestone, with some siliceous soil.

Due to the above mentioned low altitude, there are only deciduous forests in Fruška Gora, but they are dominant and semi-dominant forests. In most parts of northern Europe, there are spruce forests (taiga), but coniferous forests are much poorer than deciduous forests when it comes to the diversity of the living world.

What is there to confirm that diversity more specifically?

There are 1000 species of plants within the boundaries of the Park and 1400 species throughout the

whole Fruška gora. When compared to other mountains, one can see how strong this is. (Another comparison to get a better picture: the whole of the United Kingdom has about 2500 species and the whole of Serbia about 3500 species.)

There are no endemic plant species in Fruška Gora but about 70 of them are listed strictly in Serbia. There are as many as 30 species of orchids, who like stable habitats.

Oh, and mushrooms... in this sense, Fruška Gora is definitely the most explored mountain in Serbia. "There are 1800 species of fungi confirmed at present here, but certainly even more than that."

What I can add is that Dragiša, who earned his doctorate in after a decade of mushroom and funghi research, actually was the one who upgraded the status of the Fruška gora mushrooms population to the level of "most explored in Serbia" :) And it is definitely worth visiting his website "Nature of FG" (www.nature.fg.com), where he has exhibited an incredible collection: 10,000 photographs of 4500 species of plants, animals and funghi of Fruška gora.

"As about animals: we have 60 mammal species, 220 bird species and a minimum of 10,000 invertebrate species, which have not been sufficiently investigated. Butterflies alone have 1000 species and there are 350 species of spiders."

These numbers seem to indicate that an above average (for Serbia) research work was done in the past?

"Serbia is generally under-explored in this regard, but as Fruška Gora is close to Novi Sad it is above average. Most research has been done since WW II and while the mountain was proclaimed a national park in 1960 mostly to protect forests, only after that was the true extent of biodiversity discovered, which gave the Park its full meaning.

And there is also a rich geological and fossil heritage?

Numerous, millions of years old, fossils of plants - palm, laurel and cinnamon - have been found in Fruška Gora.

There are 14 specially protected geological-paleontological sites that witness to the time when Fruška gora was an island in the Pannonian Sea. These are underground locations that very rarely can be found simply by walking around. The most interesting one is at the monastery Grgeteg and was explored 100 years ago by the Austrians. It is special and rare a sense that all layers from the stages of Earth's formation can be seen there. On this basis even some aspects of Darwin's theory have been proved, while some of the fossils found there can be seen now in the Vienna Museum.

What can we say about the birds in the Park?

For the past 20 years the Imperial eagle has been the symbol of the NP. We also had the last two couples of the Golden eagle (*Aquila heliaca*) in Serbia and they were put under the first level of protection, but three years ago they disappeared. Squirrels (*Spermophilus citellus*) are their main food and they are protected as well, but as former swamp-and-steppe Vojvodina was drained and turned into arable land (similar to what's happened in Hungary), there are no much squirrels left there (most of them now still remain on Fruška gora). However, two pairs of these eagles appeared in the nearby Bačka region - and they could be the same birds.

There are more white-tailed eagles: over 100 couples in Serbia. There are about 20 of them in our area and they nest along the Danube, not on Fruška gora. But they come here to a feeding spot which offers pigs from the surrounding farms. That way they do not have to wander far away for food, which reduces the risks for them."

You mentioned that there have been some small but important additions to the Park area in the recent past?

"The vegetation of Fruška gora is a forest-steppe type, that is a mosaic of forests and (on the perimeter) of meadow-steppe. Until a few years ago, meadows were outside the NP boundaries, but because of their high value (mostly due to orchids - there are 9 sorts of them on just one meadow above Beočin village), they were added to the Park. (Some meadow-steppes are on the edge of the Park and some are "enclaves".)

By the way, the protection here is not based on the type of property, be it private or state. The state prescribes what has to be obeyed regarding nature protection and then it must be respected even on the private property."

So, which levels of protection are there?

The first level (strongest - any activities are forbidden and entry is only possible with an escort), then the second and third one. The first level is applied to about 3% of the NP area. The second level is applied to most of the territory. The third protection zone covers sections along roads and quarries."

Do you cooperate with the general public to perform some tasks in the Park?

"Each meadow biologically tends to turn into a forest (the process is called succession) and this is prevented or slowed down by grazing. But Serbia does not have very rich livestock any more - that is why we cooperate with students (funds are provided by the state) to clear the most important meadows. It is enough to do this once in a few years."

What is generally the state of the forests here? Did you have problems to reach a certain level of quality, do you have problems to maintain it now?

"The NP is not funded from the state budget but uses commercial forestry in the level 2 protection zones to generate revenue. This type of forestry is conducted in accordance with specific principles - the point is not to just cut down a tree, but to improve the forest.

At the time when the NP was established its forests were pretty bad. More than 1000 years ago this was a rainforest of 170,000 ha but it has been shrinking over the centuries, turning the former rainforest to 23,000 ha of plain forest. The Counts of the Austro-Hungarian Monarchy used to mercilessly cut down good quality trees and to left the cut areas to renew themselves. The consequence was that the lime trees spread rapidly. The oak does not easily grow from the stump but the lime tree does - that is why the lime tree easily wins the race and conquers the terrain. Fruška Gora was practically three times completely "trimmed down" and left to rebuild itself, so at the moment of the Park founding 90% of its area was under forest grown from stumps (so-called stump or sprout forests).

But what we want is the so-called "tall" forests, created by growing from seed. Turning the stump forest into a tall forest is a slow and expensive business. It takes about twenty years to implement the necessary measures - and only then forest can be left to further develop by itself. It is rarely the case that all the trees are cut down in one zone (the so-called "bare cut"). Instead, it is done gradually.

Luckily, diseases (forest drying, etc.) have not been observed in Fruška gora. Our forestry is based on ten-year plans. These plans are prepared by the Faculty of Forestry and approved by the state."

Tourism is something that is always in the plans of green areas along the Danube. Is it the same here?

Tourism on Fruška gora is of the excursion type. We have 250 km of marked hiking trails. But it is nice to

mention that the number of bicycles has increased 10 times (which is not a problem because cyclists ride on existing trails - the problem is to some extent motorcyclists who ride off the asphalt, and that is not allowed). But it looks that there is not much room to make money from tourism: because of the urban environment in which the mountain is located and the openness of the area, it is difficult to charge tickets. Also, the roads in the Park are public ones. Therefore, the revenue from this type of economic activity in our case will always be much less than revenue from the forestry. "

The mountain is surrounded by urban areas...

"Well, there are no truly wild zones in Fruška gora at all. And there are as much as 54 settlements around it."

Which problems does that fact bring?

"The key problem of Fruška gora is its openness to the environment and large population on the mountain as well as in its surroundings. It has been attacked in various, but mostly discrete ways, and that is difficult to prevent. When we report offenders, the trial is typically dragged on for several years, and eventually the majority of offenders are released.

Our guard service has about 16 employees assigned by the zones and these are our rangers (the official name is "nature guards"). They are not paid by the NP but by the state."

How does it look to be the sole biologist among forestry engineers? Dragiša will not say that he is completely relaxed among the colleagues who are in some sense "opponents" to a biologist. Forests must be (sometimes a bit strenuously) "defended" from them - but at the end of a day, he enjoys his workplace. And that is in nature, watching the living world of the Park.

The Info Center of the Fruška Gora National Park was opened two years ago. It is located in a former restaurant located exactly on the pass that divides the southern and northern side of the mountain. The center has an exhibition area as well as a central hall for presentations and receptions. A lot of work is being done to educate children - tours, excursions, lectures...



Cycling friendly space near the Center entrance

Among the before mentioned 250 km of hiking trails, there are four special hiking trails - each about 10 km in length. Near the Center there is start of an educational trail which is 800m long and can be walked in one hour. There are ten panels along the course, covering ten different topics in the nature of Fruška gora.

For the last five years, the Park has also been offering mountain bike rentals - 10 in the Center and 10 in the head office in Sremska Kamenica.

The eco-camp at Straižlovo (a popular picnic area of Sremski Karlovci and Novi Sad) belongs to the Park, but was unfortunately rented to a private user two weeks ago - it didn't look interesting enough to the current Province authorities.



The monument to the human negligence" - an artwork near the entrance of the Info Center.

SPECIAL NATURE RESERVE KOVILJSKO - PETROVARA- DINSKI RIT (Vojvodinašume)

*An Amazon for the Novi Sad dwellers who
do  like to travel far from home*

Koviljsko-Petrovaradinski rit (KPR) is a complex of bar-swamp and forest ecosystems in southeastern Bačka (region in the Vojvodina province of Serbia). It spans from town Petrovaradin to village Gardinovci (past Beska bridge on the Danube) as one functionally integrated unit. Main values of the KPR are the conservation and diversity of native relief and hydrographic forms of its rits, river islands (so-called "adas") and arms, ponds, swamps. Then there is the conservation, diversity and richness of native plant habitats (forests, meadows, reeds) and the fauna (206 birds species and 24 fish species, mostly from the carp family). White and yellow water lily are specially protected as endangered species, but there are other protected plant and animal species in the Reserve.

The KPR was proclaimed as the internationally important bird area (IBA) in 1989 and an important plants area (IPA) in 2005. In 2004, it was included in the list of protected areas dependent on the water and significant for the Danube Basin (ICPDR). Since 2012 it has been listed as a wetland of the Ramsar Convention.

The typical landscape here is backwaters, sand dunes, and meadows. The Reserve is natural retention and with Apatinski rit (on the opposite side of Kopački rit in Croatia) it represents the most preserved floodplain in Serbia. Since it is a natural fish spawn area, only sport fishing is allowed and only out of the spawning season.

When I arrived at the headquarters in Kovilj (a suburban settlement of the city of Novi Sad but actually a small town of its own with about 10,000 inhabitants) there was already a nice mix of local school kids and a group of cycling enthusiasts – a good team to explore what the day had to offer.

Our hosts were officials of the Reserve headed by Mrs. Ivana Vasić, an expert associate for protected areas and environmental protection. As the main organizer of the visit, Ivana gave us basic short facts about the Reserve and showered us with a "teaser" of the things that were waiting for us out there.

Accommodated in three boats, our cheerful invasion forces took course along the main channel of the Koviljski rit. I hoped that I could obtain at least some kind of an honorable function in my boat, but as all the kids were much more experienced than me (sailing around several times in the past), I didn't have a chance to be even a deck boy and could only listen to what they had to say to me.

Mrs. Sladjana Dabić, an expert associate for cultivation and protection of forests, introduced me to the channel story:

"On the part called Shlais the average water depth is 10m, while on the part that we are passing by right now it is 2-3m. The water areas of Koviljski rit are muddied by sediment as agricultural land is washed away and a large amount of organic matter enters the water. Therefore, Vojvodinašume ("Vojvodina Forests") had to begin with the removal of sludge. In more shallow and accessible areas we do it with a long arm excavator, while in less accessible places (mainly where willows grow) we have to use a floating excavator. This is a constant fight and not easy one: millions of euros are needed for this type of work while what we have here is actually a microsite, comparing with the whole area that we have under our control in the Vojvodina Province."



Preparing for the sail

It is never easy to protect and conserve green areas along the Danube, but what are other, specific problems that you have here?

"The rit is open in the sense that there are many entrances to it. Hence, it is difficult to control the entering points and visitors. The total Protected Area has 5900 ha, of which Kovilj part has 4000 ha and Petrovaradin part 1900 ha. Until recently there were six guardians of the Protected Area, but the newer legal regulations allow only one officer of a specific type per every 3000 ha of a surface. So Kovilj and Petrovaradin parts can have only one of them, per each area. As a result, here in the Kovilj part we have only one nature guard, one fishery guard and one hunt guard."

Every PA along the Danube has a goal to protect some endangered species... You are especially proud of eagles?

"We have six nests of white-tailed eagles and there are cubs in some of them right now. This is an extremely rare and sensitive species of bird listed in the World Red List. With a wingspan of about two meters and extremely strong, it also barely can stand enclosure. The rescue of every specimen is a major event and every such case is registered with the London

Ornithological Archive - that testifies to the importance of this increasingly endangered species. Eleven nests of this bird are mapped and regularly monitored in the "Gornje Podunvalje" Nature Reserve (from the Danube entrance to Serbia and down to Apatin). But no one can exactly say what is the exact number of them in this region, as they often have more than one nest.

If a new nest of the White-tailed eagle is observed here, a zone of 100 around it is immediately closed for any human access or activity. During the nesting period (which lasts from mid-December to mid-June) this range is increased to 200m."

We have to keep an eye on other wild animals as well. When the level of the Danube greatly increases, game (especially deer) climb high soil beams and foresters have to pick them from there and transport them to safety. There are also jackals here, but not like in Banat and around Sremska Mitrovica, where there are a lot of them.

The KPR has the same problem as other PA's in Serbia: a need to manage finances through commercial exploitation of available natural resources. And again, the primary commercial activity of this reserve is forestry. But there is another source of income that has good potential for the future; considering the short distance between Novi Sad (20km) and Belgrade (60km), and the immediate vicinity of the E75 highway, the Special Reserve of Nature Koviljsko-Petrovaradin Rit has outstanding opportunities for establishing and developing tourism and tourist offer in general. Cooperation with the Mountain Movement of town Sremski Karlovci is a good way to use these opportunities while bringing benefits for both partners.

The educational trail on the site "Kurjačka greda" is 1000 m long and suitable for small groups of visitors.

The Shlais locality is one of the most visited and attractive sites in the entire reserve. It is closest to the Kovilj settlement and forms a nice pleasure zone for nature lovers, fishermen, and walkers. There is a possibility of renting boats and fishing at the Shlais. The Tikvara locality is located by the embankment, next to the local road and in the immediate vicinity of the Kovilj monastery. An Ecological-educational Center that was built on this site consists of an outdoor ecological classroom and a birdwatching tower offering views of the surrounding forest and ponds. The Center has the capacity to accommodate 20-30 students.

The Kovilj Monastery from the 13th century has particular importance and brings an additional attraction to this area as an integral part of the offerings. And we entered another canal that was dug to increase the flow but also to provide a roundabout for another attraction: the circular tour aboard a tourist catamaran (provided through a project conveyed by the Mountain Movement of Sremski Karlovci).

But...

"But the people from Novi Sad still are not in the habit of coming here", says Sladjana. "We have to promote our offer a lot more."

But...

"But while missing public awareness of the tourist attractiveness of this area, we still "enjoy" a nature conservation problem that is typical for PA's which are close to big settlements. The town of Kovilj has about 10,000 inhabitants and it puts a lot of pressure on the Reserve. Trucks carrying logs are destroying the gravel road atop the embankment.

Cows that are left unattended destroy thousands of acres of tree seedlings - first by using them to scratch themselves and then by eating their herbaceous canopies. Despite frequent reports and even litigations, there is no necessary level of understanding of the state authorities. At the nearby reserve Obedska bara, "Vojvodinašume" gives large areas to the cattlemen and the benefit is mutual. But as livestock



production is declining in Serbia, small producers are choking and there are fewer and fewer real livestock farmers: many of them are actually struggling just to bite into agricultural projects and to come up with the money that way."

Unlike NP Fruška gora, the KPR has to fight several significant plant diseases. The fungus disease "Dothichiza canker of poplar" (Dothichiza populea) decimated the black poplar in the past - that is why the Institute for Lowland Forestry is constantly introducing the production of poplar river clones.

"Conditions have changed a lot in modern times and new clones have to be introduced because it is very dangerous to have only one variety on the whole surface."

(Speaking of poplars, there was an edifying strategic mistake that was made in the past in the Srem region, shared with Croatia: while it actually was not an area suitable for intensive poplar cultivation, after a bug pulp factory was built in Sremska Mitrovica poplar plantations were established everywhere, to feed the factory. But the poplar likes to "swim" for a while, and dry areas far from rivers and channels definitely were not friendly habitats for this tree. So commercial results were obviously not that great.)

Ash and oak (Quercus robur) suffer from Chalara fraxinea - dying of peak shoots. As Sladjana explained to me, it is caused here by heavy traffic (the dust raised by heavy truck wheels has a specially bad influence). The oaks are also attacked by the chiggers and fungi disease Powdery mildew (Microsphaera alphitoides) that choke them and take their maturation energy.

There is also constant pressure from invasive species. Ash (pajasen) and Amorpha fruticosa (sometimes referred as a sort of acacia because of the look of the leaves which reminds that of the Acacia sp.) are very

expansive and difficult to control because use of pesticides is not allowed in the protected area. The only natural way to suppress it is the livestock, that likes to eat them.

Free-floating water weeds (duckweeds or Lemna) are also aggressive and reduce the amount of oxygen available for fish.

Let's also mention the interesting "honeydew" - excrement of caterpillars that drips from the forest branches as a "drizzle", It is not harmful to plants - but it is a strong allergen.

One thing that Sladjana didn't want to miss at the end of the boat ride: "In 2016, after a visit to the monastery of Kovilj, Prince Charles also went on this same boat tour that we did!"



In the background: the deadly cows of Kovilj

But for her, the best is... "Every new forest wherever there wasn't one. The vast flat space of Vojvodina has been over time transformed into a granary, but Vojvodina therefore also became one of the European zones with the most disappeared forests. The European recommendation of 0.16 ha of forest per capita

cannot be fulfilled here. Only 6.5% of the province is under forest and mentioned recommendation would require 13% under forest - twice as much. Three years ago, the Provincial Government allocated 5000 ha for afforestation purposes, but in the form of small areas where it is difficult to maintain and defend the forest. Here, the forest is also cut down by the church. Every March in the Petrovaradin part of the Reserve, local villagers burn the reeds which often causes fires in which 20-30 ha are burned down. There is little relief in the fact that this happens before the migratory birds return. It takes 15 years for the oak to reach a diameter of 15-20 cm, and its rotation coppice lasts 120-180 years (or about six generations of forestry engineers). That's why the damage is so huge when a fire enters the forest."

Ivana Vasić wanted to note this: "For me, our biggest success is the multifunctional use of the territory: forestry, fishing, hunting and tourism, while protecting nature. And it turns out that it's all possible to have all of it in the same place."

After several kilometers of bicycle ride along the dam, we arrived at a point from where the catamaran would take us to Sremski Karlovci, at the right bank of the Danube. This is where I met **Mr. Aleksa Jeftić**, President of the Vojvodina Scouts Movement:

"The National Scouts Movement in Serbia was founded in the 1960s - next year we will mark 60 years of existence. During that time, over 340,000 ha of forests were planted in the territory of the country. In our local section, the last 15-20 years have been characterized by environmental education.

In 2006, we created the conditions for our own facility in Sremski Karlovci - an 18th-century building was purchased and our Educational Center was built there. The center has 46 beds and is also accessible for people with disabilities. Geothermal heating is provided.



Five years ago, we joined a family of European youth centers - out of a total of 11, this is the only one located outside the European Union. We are unique in something else: while other youth centers are recognized and subsidized, we have to swim in the commercial market, and ensure sustainability through various programs and services to other organizations. For example, at the moment we have 30 guests from Czech Republic. And we are proud of the fact that every civilian organization that has used our services - has come again.

Cooperation with the Vojvodinašume goes back to the time of their founding and since then we have joint activities each year. We usually make plans for the season and then submit them to the Vojvodinašume, then they do their best to help us with mechanization when where we need it, etc. But even more important help is their expert work, advice and control.

The Scouts also organize work camps and one example was the renovation of the Karlovci arm - cutting and removing invasive species on the canal parallel to the Danube, on the length of 2250 m.



The view of Sremski Karlovci

One poll found that a staggering 64% of school children in this region had never visited the Danube. And that is the reason why we continued to work on the channel, creating a shaded space for 20 children and cleaning an area where the future Visitor Center is planned.

Our Center is named "Radulovački", in memory of late Miodrag Radulovački (1933-2014), an American scientist of Serbian descent who financed the reconstruction of the house where the Center is located.

Very symbolic, he died during a visit to Sremski Karlovci in 2014. Another coincidence is that his birthday was on April 22, which is also Planet Earth Day, and that gives double inspiration to mark that day in our activities.



The town is full of beautiful architecture - you can find details on the internet. But among all those man-made town landmarks I couldn't resist to pick up this lovely, huge, protected sycamore that was...

DJERDAP NATIONAL PARK

*In a nature kingdom with a dark secret that could destroy Serbia?
(see at the end)*

The right place to begin visit to Djerdap NP, on the Serbian side of the Iron Gates, is Donji Milanovac - a small town located right in the middle of the 120 km long gorge.

In Serbia, if you say "Gvozdna vrata" (Serbian expression with the meaning "Iron gates") a few would know what you are talking about. "Djerdap" is what everyone knows. The word comes from Turkish word "girdap" (and it came to Turkish language from Persian language) that denotes dangerous place with a lot of maelstroms. Some 150 km upstream, at the town Golubac, the Danube is 6 km wide from Serbian to Romanian coast. And here, on a short stretch called Kazan (again Turkish word meaning "cauldron"), all that water goes through a gap that is only 150 m wide at its most narrow point. That is why Kazan used to be a really dangerous place for ships, with its rocks and reefs protruding from the "boiling" water. Special local pilots, "locs", used to embark ships and guide them through. After the dam for the Hydroelectric Power Plant Djerdap I (HEPP Djerdap I) was built, the water level increased for 35 meters and the water covered rocks, turning Kazan into a calm area.

I did exactly that, and my first interviewee was **Mr. Goran Žikić**, a Hunting and Fishing expert of the Park.



From 6 kilometers to 150 meters: the spectacular squeeze on the ancient Roman Limes Moesiae

The first thing to know about the Park?

"The area of the Park is 64,000 ha. It stretches along the Danube at 120km in length, from the small town Golubac to the small town Kladovo. And here in Donji Milanovac, we are exactly in the middle of that distance."

And there is the (in)famous Power Plant...

"The Hydroelectric Power Plant Djerdap I was constructed in the early 1970s and it raised the Danube at the location by 32 m. The lake extends to the mouth of the Nere but the slowdown of water is felt all the way to Slankamen in Vojvodina!"

So the consequences were...?

The dam has cut the migratory paths of sturgeon species and changed the structure of the fish stock. The bottom of the river became muddy so some species disappeared (linjak/Tinca tinca, redfish), the number of barbels (*Barbus barbus*) decreased drastically, while the Golden-eyed pike (*Esox lucius*) was reduced to a negligible number. New, invasive species of fish have emerged - gray and white silver carp, amur, babuska, cverglan, gobies (*Aphia minuta* and *Crystalogobius linearis*), topmouth gudgeon.

Before WW II, no one took care of where these species spawn. In 2010, a sturgeon with a chip from Hungary was caught here. The hydroelectric plant at the time of construction assumed the obligation to build a hatchery on the Serbian side. For this purpose, large ponds were built in front of the village of Kostol (a few km downstream of Kladovo), but they were never put into an actual operation.

Fifteen years ago, a local initiative led to the opening of a commercial sturgeon farm. The fish were caught near the village of Radujevac, below HPP Djerdap 2, and transferred to the breeding farm with the idea of producing caviar (in the times before the dam was built, the caviar was of better quality than the Russian one). But 10 years ago a ban on hunting morons was passed, and this business failed.

The Serbian Ministry of Energy so far keeps denying any talks on the construction of an sturgeon elevator, even on condition that the money is provided from abroad. (In Serbia, one such lift already exists at a hydroelectric plant on Lake Bajina Basta, near the border with Bosnia.)"

I was very fortunate to find in the local tributaries of the Danube a subspecies of brown trout found in only a few more rivers of Eastern Serbia. The genetic determination determined it to be a special species.



In 2012-2014, special researches were conducted, on the basis of which the doctoral dissertation was written."

I must admit that the meeting with my next interlocutor - Mr. Dr. Nenad Radaković, Director of the Park - left me in quite a shock: nowhere on the Danube have I been served such a package of depressing facts. And I thought I knew a lot about this area...

"Sludging is a significant problem in the river here. The Djerdap Gorge is the collector of the Europe. The sludge can be cleaned but the question is what

to do with it then, because it contains cyanide (which got into Danube after past leaks in some Romanian mines), arsenic (from another mine). After the NATO bombing, they were joined by radioactive waste from that was washed off from bombed surfaces, as well by (proven carcinogenic) pyrene released when transformer oil from big electric power stations of Novi Sad were hit and set in fire. There are also fertilizers from the endless fields of Vojvodina, as well as various "ordinary" garbage. The largest deposits of sludge are near Golubac, where the Danube is the widest (6 km from Serbian to Romanian bank); here, tailings from the Romanian copper mine in the hill

above the river pollute the entire riverside all the way to the small town of Veliko Gradiste, on the Serbian side.

We are supposed to call this, um... "sludging"? It looks like quite a euphemistic name for what you said. And how does that... sludging affect fish, how does it affects people who eat the fish?

There are still professional fishermen (so-called "alas") on the Danube in Serbia, and so is in Djerdap. They deliver fish to the table. In 2012-2013, in cooperation with the Institute from Serbian town Kraljevo, a survey was conducted on the amount of heavy metals on water, sludge and in skin and bones of fish. It was stated that the fish did not contain unacceptable quantities and did not contain mercury at all.

How is it possible that fish living and swimming above a deadly sludge is not dangerous to eat?

The explanation is that the dangerous layer of sludge has sunk deeper to the bottom - now it is at depths of 50 cm and more, and is insulated by new layers of sludge.

If that is true, another way to look at it is still that there was a period of several years (a decade...?) after the bombing when the poisonous sludge was in direct contact with water. And people still used to eat fish at that time?

In Donji Milanovac, where this National Park Directorate is also located, the treated water from the Danube has been used for drinking in the last 5-6 years. The advice is: don't drink it.

The measured quantities of some elements are than 100 to 1000 times above than allowed ones. Before switching to this water source, the city was supplied with drinking water from the nearby Poreč River, coming from the hilly region above the city. But the river runs through the Bor mine area on the South

where copper and gold are extracted and processed. The tailings from this processes are very toxic, so even at that time the water from town plumbing was not used for drinking: the citizens of Milanovac have long been accustomed to using it only for technical purposes."

Let me mention here an article from a Serbian newspaper that I had found at the time of writing this text. It informed about pollution of the Danube water in Belgrade with bacteria *Escherichia coli*. But it was just an overture for this bleak fact: in former Yugoslavia, no government has ever tried to build a wastewater treatment plant. Anywhere. They didn't even think about it. So the wastewater from the sewage systems still goes directly into rivers and that is why the Danube, as well as the river Sava and rivers in all other Serbian cities along the banks are filled with feces. The only difference is that Belgrade is by far the biggest town on Serbian part of the Danube and that's why the river is most polluted on the stretch after the capital. (The city has over 120 direct sewage discharges into the Danube, and about 100 direct discharges into the Sava.)

In the past not only there were no plans for wastewater treatment plants, but there were also no urbanistic measures that would create preconditions for the construction of such plants. There are plans now, and they show that to build five necessary plants in Belgrade (in order to cover an area of about 1.5 million people) one billion euros is needed. The first phase actually begins this autumn and its total worth is 285 million EUR (provided by the Serbian government) while complete Belgrade wastewater treatment system will cost about 600 million EUR.

The European Union criticized Serbia several times regarding the pollution of the Danube in the country, but so far didn't show an interest to help to resolve this problem (Serbia is now the only Danubian country that is not a member of the EU.)

And it seems that it is actually not local but an inter-

national issue: according to a regular microbiological survey (it is implemented every six years) by a group of Austrian university scientists, the Danube is contaminated with feces along its course through Serbia, Romania, and Bulgaria. The last survey was carried out on a 2,600 kilometer-long distance from the source to the Black Sea. Samples were taken from 30 sites in the middle of the river as well as on the banks, and the main tributaries were also analyzed. The results showed that the situation in Hungary has improved and, unlike in earlier years, the Danube in Budapest is less polluted. Extremely high levels of pollution have been reported in the vicinity of Ruse (Bulgaria) and Arges (Romania), where wastewater from Bucharest flows into the Danube (with a registered recent improvement in water quality as a consequence of the development of local wastewater treatment). Researchers were expecting to find significant pollution in the Austrian part as well, but except in one place the pollution level was moderate (1,000 *Escherichia coli* per 100 milliliters of water). Sooo... In Germany and Austria they are passionate about free-flowing sections of the Danube (sections between hydroelectric power plants where the river flows as it used to flow before that plants were built). At the other side, the free-flowing Danube is a normal thing all the way from Slovakia down to the Iron Gates and then all the way to the Black Sea - but we could instead talk here about the free-flowing s**** ;)

Ok, lets go back to the talk with Mr. Radaković:

Are there other bad news here?

„Just a couple of them are left... On the Romanian side, several years ago wind generators were installed at the entrance to the Djerdap Gorge, which disturbs birds.

And then: our relations with the HEPP Djerdap I are not satisfactory. More precisely: we have no contact with them. And they have a habit to suddenly, and

without any prior announcement, open the dam gates and lower water level in the lake. The level drop sometimes reaches two meters during one night, during full spawning time of the fish. This, of course, causes serious damage and the consequences are felt even two years after such events. In 2004, we had large fish mortality for exactly this reason. We regularly reported such incidents to state inspectors, but to no avail: HEPP Djerdap I and Djerdap II are extremely important for supplying the country with electricity and the energy lobby is very strong. So they can allow to themselves to not care about cooperation with anyone locally, including the National Park."

I must note a special curiosity: Donji Milanovac does not receive electricity from HEPP Djerdap I, but from a thermal power plant in remote Kostolac?

"To build these huge power plants it was necessary to flood a lot and to destroy a lot. And after all that, strange thing is that they don't provide electricity to our town. Power plants certainly have a large budget for nature conservation, but they do not have professional staff to deal with that task. There is no knowledge of how to use the funds in an efficient and focused way. Therefore, collaborating with us would be useful for both sides, but well... As for the problems that they cause, there is a rulebook for damages in fishing industry - but for example, how does one determine damages when it comes to fish eggs?"

All this was depressing - let's go to "normal" problems

"A pretty common problem is ignorance - not only of visitors but also of locals - about the way Park works. It is a common opinion that the Park is financed by the State, but all national parks in Serbia are unfortunately public enterprises and have to earn money in order to survive and to be able to perform their basic job - the nature protection. We are engaged in commercial forestry in the zones with the 3rd degree

of protection, and we are also involved in numerous international projects. But it would certainly be much better to reorganize the status of the national parks in Serbia. The paintings in the Louvre are a treasure of humanity. To see them, we need to buy a ticket. It should be the same with natural treasures (such as national parks) - instead of forcing them to function by eating their own substance through forestry, hunting or fishing. And if the State says that "wolves should no longer be hunted", then the State should also compensate for the damage done by the wolves.

Another problem over the last 30 years is that the State has not yet purchased all the land that is in the zones under with the first (highest) degree of nature protection. Some of these zones are the property of the Army, while other localities are under private ownership. One example of problems that arose from this situation: the locality "Pecka bara" was under the first level of protection, but was owned by the Army. The "solution"? The locality was excepted from the first level of protection."



*Before the Djerdap dam was built, navigation through the gorge was tricky and dangerous. Devices like this were used to show to boats priority of the pass in very narrow parts.
Up: go. Down: stop and wait.*

Could we advance now to some good things?

"Let's start it lightly :) , with a good outcome from a bad situation. The general population decline in Eastern Serbia, including the Danube coast in this part of the country, is intensive. However, this is good for nature conservation: the number of forest systems increases, cultivated areas give way to forests.

A great honor for the Park is the State's proposal to declare Djerdap NP as the first Geopark in the country. Geoparks near Serbia exist in Slovenia (Idrija), Croatia (Papuk), Hungary (Balaton) and Romania (Hațeg), but there are none in Bulgaria, Macedonia and Albania.

We have a number of very interesting phytocoenoses (communities) here. Walnut and nettle tree (*Celtis australis*, an autochthonous species) are outgrowths of a maritime Mediterranean climate. Sword hazel, oaks, ash and beech (Moesian type), wild cherry and wild pear - all these plants are in Djerdap much larger than average. We also have yew (it grows on vertical rocks) and the large-flowered anemone. There are 40-50 of autochthonous woody species. And there are also natural arboretums where different types of trees grow side by side.

Bears sometimes wander in the Park - usually when the Danube freezes and they can cross over from Romania. Fishermen also reported on deer swimming across the Danube, apparently in search of quieter and safer zones.

And there are always legends and stories about sturgeons. According to Brem, a sturgeon can grow up to 9 m and can weigh up to 1800 kg. But catfish is quite a decent replacement: one of the 2.1 m and 170 kg was recently caught, and much bigger samples are part of fisherman history here. Jean Jacques Custo descended into the depths of the Danube in 1990 (to 90m below sea level!) and claimed to have



seen huge catfish down there. But it should be emphasized that the ban on catfish fishing is currently in place.”

And there is also the historic and cultural side

“The prehistoric settlement of Lepenski Vir, one of the cradles of European civilization, was accidentally discovered during preparations for the construction of the HEPP Djerdap I dam. In 1601, Orbinus wrote the work “The Empire of the Slavs”, stating that one of the founders of the Lepenski Vir could be Noah.

There were several other confirmed archaeological sites in the gorge but they were unfortunately submerged by lake water. Fossil rye and shark tooth fossil have also been found there.

It is amazing that nature has remained preserved until today, for such a long period of time and through the shifts of various civilizations. The main reason is probably the difficult accessibility of the terrain. Unusual folk customs, food, and costumes are also preserved.”

How does it look like to work in a National Park that is established in such a complex area?

“Working in the Park requires knowledge in many fields. In turn, there are hidden values that constantly delight.

I’ve been working here for 23 years and what I’ve learned a long time ago is that generations of people are responsible for today’s level and status of the Park. In recent decades, there has been a significant increase in the number of tourists and many of them want to get acquainted with the values of the Park. Tourist areas are formed on the basis of the Law on Tourism and are managed by two Limited Liability Companies: “Golubacki grad” and “Lepenski vir”. Cooperation with these organizations is great, but they have 100,000 visitors per year and have no formal ties to the Park. We feel that we should be involved in this process too, but there are no our representatives in their management structure. No other NP or protected zone in Serbia has such a combination with commercial entities, but ten years ago some lobbies in cooperation with local municipalities and local self-administrations were strong enough to establish this system.”

Let’s finish with some achievements and plans/wishes for the future

In 2018, we opened a Visitor Center in the village of Tekija, 16 km upstream of the HEPP Djerdap I. Much work is also being done to mark the area with signposts, especially for pedestrians. In many places we also have new info boards with information about the values of the Park.

We are planning reintroduction of the Djerdap tulip, as well as reintroduction of the Griffon vulture (*Gyps fulvus*). There were about 56 of these birds here in the past, but they were killed during the times when wolves population was reduced by poisoning with strychnine.

There is a nice idea of establishing a Transboundary Biosphere Park, which would be great both in practical and symbolic terms (the river that does not separates but connects). But at the moment we do not have enough human resources to do such a thing.

In the near future, some modest (but yet valuable) achievements will be the procurement of tourist minibuses and boats, as well as of drones for terrain monitoring.

Until 1990, Donji Milanovac had a meteorological station and in that sense was part of the world. Hundred years ago there were similar stations in village Tekija and some other places. It would be good to have such tools again - if not complete stations then at least rain gauges. (By the way, according to the data from former stations, Donji Milanovac was the sunniest place in the former Yugoslavia - along the Adriatic island of Hvar!)

Success? For me it is, above all, the treasury preserved for future generations, and a boost of tourism at the same time. Of the current things, I would like to single out a new map of the Park as well as a new collection of promo and info-material. We also have a renovated exhibition which now looks really nice and in that sense we don’t have to be ashamed of other parks.”

Next interesting person to meet was **Mr. Zoran Milovanović**, a biologist in the Park.

The three monographs

“There were three important projects in 2010-2012, executed in collaboration with the Institute for Nature Conservation and the Ministry of the Environment. They resulted in three monographs.

The first one lists all birds with particular emphasis on endangered species in the Djerdap area. There are 180 species listed there, out of 365 in total in Serbia. This publication was also used for Natura 2000 and it shows that the Djerdap gorge is very well preserved habitat and hence for a reason declared as an Important Bird Area (IBA).



Mr. Zoran Milovanović

The Griffon Vulture (*Gyps fulvus*) exists in Serbia today only in the canyons of Uvac and Tresnjica, but until 1948 was present in large numbers in Djerdap too. Therefore, our desire to have him back is understandable. Reintroduction is planned in cooperation with the Uvac Reserve. (Interestingly, the process starts by keeping young birds in cages with a view of their future nesting site, until they are mature enough.)

We have three pairs (or three nests) of the Golden eagle (*Aquila chrysaetos*) and there are also dwarf eagles (*Aquila pomarina*), gray falcons (*Falco peregrinus*), the mountain woodpeckers, and prдавac quails.

The second monograph was about cave bats, of which there are 15 species here.

The third monograph was about speleological objects in the Park area. Designed in collaboration with the National Geographical Institute, it contains descriptions of 30 caves and pits."

I understood that you have participated in some earlier stages of the DANUBE PARKS?

"The Park took part in the first and second stage of the DANUBE parksCONNECTED project. In that frame, I followed two bird species along the Danube banks in Serbia, from Ram to the mouth of the Timok river (ie. to village Radujevac), in the total length of 240 km. The first one was the Little ringed plover (*Charadrius dubius*) and the second was the Sand martin (*Riparia riparia*). These two species are in fact indicators of habitat conservation, and the results were positive. It was a nice achievement and It is a pity that the Park is not involved in the present stages of the project."

Your point of view of the HEPP Djerdap I dam influence is quite different from what I heard about similar impoundments in the upstream countries?

"To my opinion as a biologist, the dam and the lake of HEPP Djerdap had a positive impact on the flora in the gorge. It was due to the increased humidity: a lake ecosystem and a wintering ground for birds were formed after the dam was built. But I won't go into other aspects of the influence."

There are some interesting particularities in the gorge?

"Definitely. For example, normal distribution of tree species with elevation is oak -> beech -> conifers. But here, on the shore at the locality "Hajdučka vodenica", we have the vegetation inversion - beech below oak.

The Iron gates gorge climate allows the nettle tree (*Celtis australis*), which is a Mediterranean plant, to grow as a relic from the Ice Age, during which the climate here was milder. Even today, all the way until the end of the gorge close to the HEPP Djerdap I dam/border crossing, we have the feeling that we are somewhere in the Mediterranean or in Macedonia, and past that point there is a sudden change...

One sad thing to mention: although the traffic on the road through the gorge is not that intense, it affects large numbers of animals (especially large and small mammals) because the road intersects their morning and evening paths of movement (towards the water and from the water). Sometimes while I drive to the office early in the morning it looks to me like a heart breaking slaughterhouse: roe deer, foxes, hedgehogs, badgers... The only solution would be to limit the speed to 40 km/h, which is difficult because this is the main road to Donji Milanovac and Kladovo towns.



On the ferry to the Iron Gates



Let's talk about the teaser for the top: is there a dark secret that in the Djerdap National Park that could destroy Serbia?

In 1948 Josip Broz Tito split with Stalin and Yugoslavia took its own way, separately from the Eastern Bloc. But it was just the start of a "mini Cold war" between Yugoslavia and USSR, way before The Cold War. And for the next seven years, the country expected an attack from surrounding countries of the Eastern Bloc that could happen at any moment (similarly to what happened later to Czechoslovakia and Hungary). That "mini Cold war" ended in 1955 when the new president of USSR Nikita Hruschov visited Belgrade and apologized for Stalin's politics toward Yugoslavia and Tito.

How to protect a country from a possible attack by a multiple times stronger invader? Well, according to a story that I heard many times (and usually from reliable people) while visiting the Djerdap gorge area in the past, one of the ideas was to use the fact that the rugged area of the Iron gates consists of the limestone karst with a lot of caves and extremely deep cracks. In Kazan, the most narrow part of the gorge where the river is only 150 meters wide, these huge cavities cut deep into the cliffs. The plan was to fill the cavities on the Yugoslavian (nowadays Serbian) side with thousands of tons of explosive and to detonate them in case of an invasion. As a result of the explosion, four hundred meter high and couple kilometers long cliff of Kazan would collapse into the river, forming a gigantic dam that will block the Danube and cause formation of a lake that would cover half of Serbia (the part of Yugoslavia that would be first in the way of the attackers from the East). It would block approach to the rest of the country, of course at a tragic price. But the Yugoslav military doctrine, that was based on the Soviet one, incorporated the stand that civil losses are acceptable as long as they



The Golubac fortress in the sunset

help to protect the land. (One remnant of that past is the fact that many military bases are positioned in areas densely inhabited by civilians - that way they are much harder to attack or to be precisely bombed from the air.)

Some even believe that the explosive is still there: the entrances of cracks and caves were tightly sealed with tons of concrete plugs and it would be almost impossible to empty what is inside of them.

PERSINA NATURE PARK

The most ecological jail in the world?

Persina NP was established at the end of 2000. It spreads on municipalities Nikopol, Belene and Svishtov, covering a bit less than 21,800 ha. This includes Persin Island (hence the name of the Park), that is 15 km long and 6 km wide - the largest in Bulgaria and the fourth largest on the Danube. There is a group of four islands in Nikopol area and another one - the Danube Archipelago of Belene - with 19 islands (5 of them belong to Romania). There is some kind of Micronesia there :)

The islands were proclaimed a Ramsar site in 2002. and with an area of 18,330 ha, it is the biggest Ramsar site in Bulgaria.

Within the Persina Nature Park, there are several protected areas, designed to protect significant ecosystems within it (mainly the flooded forests along the river and the inland marshes).

There is a visitor center in Belene - and that's where I arrived one sunny morning on the last day of May. **Mrs. Daniela Karakasheva**, the PR of the Park, took me around the exhibition space.

"The Visitors Centre for our Park was built in 2006. as a part of a big water restoration project. The architecture of the building symbolically represents a ship ashore and includes a special balcony on the second floor that reveals magnificent views of some of the islands in the Belene Archipelago."

"This facility hugely improved the quality of informational and promotional activities, providing opportunity to host events and thematic exhibitions on all



The 3D model of the Persin island in the Visitors Centre. It is possible to fill its channels with water by opening tiny valves and to observe an impact that flood makes on the island

levels, including international ones. It offers enough space to present the Protected Area and its biodiversity, hiking, cycling, and kayaking routes in the area, as well as general service tourist info."

"More than thirty percent of Bulgaria is covered by the Natura 2000, and the entire Persina Nature Park is under that regime according to the Habitat Directive. And according to the Birds Directive, we have four

different zones here. We try to present their values through our exhibition, especially because this is the only nature park on the Bulgarian part of the Danube."

"Significant part of the content has dynamic character and we regularly change it. At the moment we have children's drawings from the "Forestry week" competition. It is traditional and this year we got photos from all over Bulgaria."

Mrs. Stela Bozhinova, the director at the Park: „Bird and Fish Exhibition is held in our Visitors Centre each year and we always add new exhibits. Visitors can get acquainted with specimens from the zones of the Park that are otherwise accessible only by boat and/or with appropriate equipment.

We hire specialized experts and designers to conceptualize exhibitions. Otherwise, it is typical that after we explain what we would like to present and after an architect makes a drawing according to how he understood us, the result looks like a hotel room“.

In the future, we want to add sounds to our exhibitions.“

Daniela and two of her office colleagues (also ladies) then took me to a bicycle tour on Persin Island. The entrance to the island was not far - it is necessary just to cross the Danube arm at the outskirts of Belene. But things got quite wired when we approached the riverbank: we had to stop in front of a high wall with barbwire on the top, with watchtower and armed guards. Gate opened, they came to us, took my passport and gave me instead of it a piece of paper with my basic data that will serve as my “ausweiss“ on the island. Behind the gate, there was the only connection with the island: a narrow pontoon bridge. No photos allowed at this part.

The reason for all this: at the western end of the island there is a prison with several hundred inmates. Some of them who behave well enough can go around doing errands or field works (there are a pig farm and gardens that belong to the prison). Basically, anyone whom you meet in the fields or on the only island road is a prisoner. **Radoslava**, Daniela’s colleague with the typical, sharp Balkan sense of humor, didn’t miss a chance to comment after a truck full of inmates overtook us on the dusty road: “Our staff visits the island almost every day, but we usually use our vehicle. But today there is a great opportunity for these guys to enjoy seeing the three women on bikes.“

There are three protected areas on Persin:

1. One Maintenance Reserve. Special activities that have certain impact on nature are allowed there, but all other human influence is forbidden. There are four marshes in this zone.
2. The Protected area Persin
3. The Protected area Persin East.

In these two areas, no human activities are allowed except controlling the water level in channels.

After 5-6 kilometers we arrived at the place that my hosts especially wanted to show me. It was near the shore of a large lake, and a high wooden observation tower in the large meadow was calling to explore the views from above.

In the past, the area around the tower was overgrown with aggressive (and inevitable) *Amorpha fruticosa*. But it was cleaned last year through as a pilot project and the results were good, so this activity will continue on other zones. The cleaning was done by five workers with a pair of tractors. But finding people for this job was not an easy task. There are only about 20 inmates who move freely around the island, and they will not work for free. Others don’t like to work here due to mosquitoes and snakes, plus a prison on an island is certainly not a strong work motivation.

The tower offered a beautiful discovery: at the far end of the lake, I could see a platform that was seemingly covered with a thick layer of snow. But that white thing was moving a bit, it was showing some wings



Observation desk on the shore of the Pelicans lake



*Persina Nature Park office staff, in the middle of the area freed from the occupation of *Amorpha fruticosa**

here and there, and was obviously enjoying sunbathing far too much for an average snow entity. It was then reasonable to accept the fact that I am looking at the small colony of pelicans.

“Pelicans nowadays rest only in Srebarna lake, some 170 km further downstream. But one large colony also existed here until 70 years ago, when the embankment on Persin was built in order to develop agriculture on the island.

Ten years ago, as an effort to reintroduce them to the island, we started to build artificial platforms similar to ones we saw on Lake Kerkini in Greece. There are young pelicans on the lake now (these birds usually mate after they are two years old). Six years after the start of the project there was one pair and there are 15 nesting pairs at present, while the total number of these birds (young and breeding ones) is around 200”, explained Daniela.

Another success was the return of water to the island. That was achieved in 2006 (one year before Bulgaria joined the EU), in the frame of one of the largest restoration projects - Wetland Restoration and Pollution Reduction.

The quality of the Danube water in Belene is very good and it belongs to class 2 - which means that the water is almost completely clean. One wouldn't say it by looking at its color, but it's because of the muddy bottom of the river. (Which is quite an astonishing thing when having in mind the fecal pollution of the Danube water in Southeast Europe, mentioned in the previous story from Djerdap NP. This seems to be a manifestation of an amazing self-cleaning power that the Danube possesses, the power that is much stronger than we deserve.)

The story of the island as an isolation zone actually has a much darker history that dates from the communist past after WW II, when it was used as a concentration camp for political enemies (and those who just had the bad luck to be classified as such). Going further into the eastern part of the island, we reached a place that was still radiating strong atmosphere of suffering. A wooden arch at the entrance with the creepy inscription „Yes, 'man' sounds proudly”, a monument to all those who died from diseases or malnutrition or were simply executed, corridors and rooms of dilapidated buildings covered with countless posters showing the life of prisoners.

We had another cycling tour next morning, this time to Kaikusha Protected Site. The name derives from Turkish name for a sort of fish, and it is a marsh that remained after the draining of Svishtov-Belene lowlands. The marsh is very important space for herons, ducks and storks.

This biking route is included in the official tourist content for visitors and leads to the southern part of



Back to Belene - one more chance to enjoy beautiful landscape of the marsh.

the Park. For those who come to Belene without their own two wheels, there is a bicycle rental station in the front of the Municipality building, with three electric bicycles and a charging station. This equipment was provided through the LENA project, two months ago.

Kaikusha agriculture is mainly focused on growing corn, which is not good because the soil is treated the same way every year. There is also a negative impact of fertilizers, but legal regulations unfortunately define other institutions to control it, not the Park.

In the autumn of 2011 under Green Borders Life+ project, the Park Directorate had started activities to restore the water regime of the Kaikusha marsh (the second wetland in the Park to be restored) and to build basic infrastructure for visitors. Kaikusha is also characterized by a lot of underground water, and wells are sometimes only 2-3m deep.

After WW II the land was property of a large agricultural combine and after that, the privatization produced many owners with small properties. In the end, the big money entered the game and today the

land belongs to just several owners. Four of them are big businessmen, including the biggest landowner in Bulgaria. They use industrial irrigation systems and water from the Danube and don't need water from old channels.

„That is why they didn't care much when we were started to clean the canals,” says Daniela. “There is one canal water regulation station here and it is used several times a year, mainly in spring and autumn. We have a manual with instructions when to do it, depending on the water level that we are monitoring.”

At the end of the cycling route, we followed a short eco-trail that took us to the observation tower in the heart of the marsh. Visitors can see here typical marsh vegetation and many waterfowls. There are also jackals here, who sometimes even enter and live in Belene (I could hear them in the night from my room in a riverside pension at the edge of the town). Last year, through several actions and with the help of locals and children, a lot of plastic bottles were removed from the bush along the trail.

“There were many vineyards around in the past but the vine is nowadays grown only in home yards. The reason is that the State does not help the growers - that is, it does not guarantee the safety of the crop. The winemakers would have to secure the property themselves against natural disasters”, explained Radoslava.

And while we were chit-chatting, she told me something I never heard before: “Did you know that church bells can prevent hail? In the past, whenever these dangerous black and white clouds were spotted, the bells would begin to ring and the sound would break the clouds. This system is less powerful now here, as the bells are not used anymore in our Catholic church.”

Back in the Visitors Center, I talked with Stela Bozhinova about some interesting legal and administrative stuff:

“This is what makes us different: there are eleven nature parks in Bulgaria, but this is the only wetland park.

In our country, the difference between national park and nature park is that the owner of a national park ground is exclusively the State, while nature park can contain mixed State and private property.

National parks in Bulgaria exist only in mountains like Rila, Pirin and Stara planina. They were established in 1996 and many laws have changed since then (the only category that existed before that was the “National Park”), declaring that these parks were the property of the State. An example of a mixed property is the Nature Park on Vitosha mountain above Sofia.

Our protection system looks like this:

1. Natural monument - has the lowest level, marked only with stickers and info tags.
2. Protected Area - some activities are prohibited, protects especially valuable plants and birds; the rules of behavior are defined by scientists.
3. Managed Reserve - biodiversity related activities are permitted.
4. Reserve - the highest level of protection, no human activities are allowed. Our “Persinski blata” (“Persin marches”) are an example of that: the only thing we did there was to return water to the area and to build platforms for pelicans. That required a permit from the Ministry of Agriculture, and the Ministry of Ecology was responsible for declaring the special status of the area.

We are not registered for commercial activities and therefore can not arrange paid tours like a tourist organization. We also do have a boat, but only for re-

search and nature conservation purposes. The point is that the Park is financed from the state budget... and it is getting smaller every year.”

When it comes to benefits of the DANUBE parks-CONNECTED project, Stela wanted to point out this: “We didn't know how to articulate our concept and abilities - and then we have found a family along the Danube. We adopted many ideas and solutions that for years have existed elsewhere.”

Then Daniela gave me probably the most beautiful and emotional definition of the project success that I heard on the whole trip: **“Along the Danube, you come across different places, cultures, languages... and you can see the difference in the degree of material development and wealth. But through the DANUBE parksCONNECTED we in Persina were encouraged to see, to become truly aware, of a dif-**



Discreet, economical and efficient: this plastic grid at the base of the Eco-trail shapes and stabilizes the path. (Although I would experiment a bit with some cheeky colors... for example light blue or yellow. Or not. :)

ferent kind of fortune that we have here: nature. We thought that we were a just a green zone in a poor country, but other partners told us - no! you are rich and you are beautiful!"

Stela is surely the one who knows the best about obstacles to be overcome during project work: "While I visited all partners except Passau, I can say that it is not simple for us to go on business trips. There are internal rules and if we want to go abroad we need a permit from a commissioner in our Forestry Agency. And the answer from that side is sometimes negative. The system is very specific in other ways too. When we engage in a project and perform related activities, the financial funds that are directed to us go first to the Ministry, which then forwards them to us. But these transfers are sometimes several months late.

There is also a restriction on hiring staff. And even if we have space to do that, it is often not easy to find a specialist who would be ready to come to Belene. For example, if we have a public procurement, under Bulgarian law we are obliged to have an attorney. But attorneys do not want to permanently live here, they want to visit us only when necessary.

Earnings in this branch of government jobs are low and financial motivation is appropriate to that fact. When participating in a project, we do not automatically get extra earnings for the additional work. Such an allowance must be approved by the Ministry, but they somehow do it mainly for their employees and not for us "outsiders. Until 2012, we could have a 13th salary, but this is no longer the case.

The director of the Park can allocate money in the project. Before we start, we send a plan to the Ministry and they decide whether to go into that project, should we cut down some activities, and the like. But when a contract is signed and the project starts, they usually don't interfere much."

Do you have volunteers?

"Yes - I am one of them", enters the conversation Vasil, the park ranger and a member of the office staff. "And all my colleagues here are volunteers too. How is that? My salary is 350 EUR per month - that is why I am practically a volunteer."

But while the financial motivation is not great, there are other reasons to be satisfied and proud. Daniela says: "To me, we have two nice achievements here. First one is the maintenance of the wetland. We register a constant increase in the number of birds, year by year. Second: the successful education of young people is our big inspiration. We started when kids from this region were really little and we see that now, when they are older, they understand things well. They used to ask, 'why do we have to protect nature?' but now they say 'the nature protection is good for human health, and if we protect the nature we also live in harmony with our human nature'."

Stela wants to stress this good results:

- "First: the experience we have gained. We have milestones and I have a clear picture in my mind of where we should go, what we want to achieve in 20-30 years from now. Thus, we can plan our activities better.
- Second: for many years the Danube was boundary and people were not used to see it as more than a source of fish. (*) But today it is a bond, people are aware of it and people are more open to this chance."

(*) As a traveler along the Danube, I can add from my side that the urbanism of cities along this part of the river is also a proof of this: in the communist past, the banks of these cities were in most cases used to build industrial zones instead of promenades.



The last question to Stela was about cooperation with local people:

"There are many different administrations that overlap with ours: forestry and environmental institutions, the prison on the island, etc. Contact between the local people and the Park is not satisfactory: they do not feel that we have enough power to sanction their violations of the Park rules. They come to us only when they need help, and have no awareness of what they should respect.

Problems are sometimes created by fishermen or farmers. Some fishermen do not like our restrictions, but professional fishing is not profitable today and they do it only in their spare time anyway. Some hunters do not like when we open sluices and increase water level in the canals. They understand that wetland is good for fish and therefore for them, they understand that more water means more wild boars too - but they would like the ground to be dry just when they like it to be, in the autumn for example."

Kalimok-Brashlen Protected Area - Including a Danube under the Danube...

The Protected Area Kalimok-Braslen is the largest protected area in Bulgaria, covering 5,770 hectares between Babovo and Tutrakan and including eight islands. It might be as well the most valuable natural treasure in Bulgaria, but surely sits on the top 10 list of the country's most representative areas.

It was declared in 2001, under the supervision of the Regional Inspectorate for Environment and Water in Ruse and the Forest Inspection in Ruse. Main reasons for protection were to preserve the diversity of ecosystems and landscapes (natural, wetland, coastal and riparian forests) and to conserve habitats of rare and protected birds, plants and animals. There are 109 species of aquatic plants in the PA, 10 species of mosses, 16 species of mushrooms, 300 species of higher plants...

The most valuable assets of Kalimok-Braslen PA are birds, especially pelicans, cormorants, and herons. There are 240 bird species (130 of them nest here).

I passed a good part of the PA while riding along the lonely Danube embankment from Ryahovo to Barshlen. And I was told to look for the Tourist Info Center in Braslen, but it was far from what I expected: instead of some kind of office somewhere in the center of the village, there was a tiny, nice pine forest at its outskirts, bordering the main road Ruse - Silistra. I stopped in the middle of it, in front of a large building which architecture unmistakably pointed to the style of the 1970s or 1980s. But it was nicely blended with the ambiance and obviously recently renovated, and there was even a swimming pool in its pleasant garden. That is where I was greeted by Mr. Dimcho Petrov, the Mayor of Braslen.



Towards Braslen... Riding the dam in the Protected Area.

"Our **Tourist Info Center** was opened in 2015, in the building of a former kindergarten which was renovated and adapted through the project 'Local Initiative Fishery Groups'. The project was executed through a joint partnership of three neighboring municipalities - Tutrakan, Slivo Polje and Glavninica - with over 500,000 Eur of investments from EU funds.

But this is much more than just a plain info-center: it offers accommodation in 40 beds and is designed as a green school for primary school children. Braslen was chosen because it is located in the Protected Area, which was proclaimed in the 1980s."

We entered the meeting room and joined a group of media representatives, stakeholders and local enthusiasts, and I met my other hosts in the PA: **Mrs. Emilia Petkova** (an external expert to the project) and **Mr. Milko Berberov** (a forestry engineer and Chairperson of the Managing Board of the Friends Club of Russenski Lom).

"The Directorate of Nature Park Russenski Lom was established twenty years ago", said Emilia. "As employees of the Directorate at that time, we came up with the idea of founding the Club of Friends of the Park. It allowed us to bring together enthusiasts and stakeholders of the region and to focus their efforts in order to help the Park to achieve its goals."



The Club later widened its activities to the Kalimok-Braslen PA and immediately responded to possibilities offered by the project DANUBEparcsCONNECTED after joining its international team. Our key reason to become partners was an effort to reintroduce black poplars in the PA.

The terrain that we are interested in was at first covered by forest and then became an agricultural area. We are trying now to restore the forest, but it doesn't go without problems and delays. Last spring there was a failure in a pumping station (almost 70 years old) that drains water from the fields of Ryahovo and Barslen and that caused a flood on an area of 1000 ha. Local farmers lost one harvest and breached their EU contracts without their fault. (Some of them also had to pay fines to a state fund "Zemedelie" because they didn't plant fields as they were obliged by the rules of the fund.) And we missed springtime and had a delay in our reforestation plan, as the best time to try it again will be only next year.

The story of broken pumps is characteristic for the state bureaucracy: a state-owned company sent info about the problem to the Ministry of Environment, but received a response saying that the repair works in the pumping station were not possible because it was located in the protected area. The protests of

farmers and their visits to Ruse did not help - the time was lost and then it was simply too late.

We anyway want to continue with the reforestation project, but will need an EU assistance for that."

"Another activity that we are devoted to is to provide protectors, i.e. insulators for the electric network poles in the area, in order to protect birds from being killed by an electric shock when hitting the poles. Our experience with that problem was actually our original contribution to the DANUBEparcsCONNECTED project: the partners were at first unaware of this dimension and weren't totally convinced that our measures were needed. But it changed after German experts were consulted and statistical data confirmed the occurrence.

The brochure "Suggested Practices for Bird Protection on Power Lines" by Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit states: "Birds frequently catch fire and burn like torches. When they drop to the ground they are likely to set off ravaging wildfires. Electric utility companies may face charges for damages caused by wildfires with claims for high compensation.

White storks are especially in danger of being killed by the electric flow through their bodies because of their habit to roost on power poles while migrating, combined with their extremely long wings that can easily bridge the standard insulators. But other birds, including smaller ones, are in danger too.

We have invited all experts with experience in electricity protection to a national meeting, in order to expand public awareness and to spread the info about the problem. The first set of protectors, manufactured in Finland, was applied in 2014 in neighboring villages Ivanovo and Koshov. We mounted 300 pieces on 100 electric poles (there are three protec-

tors per one pole). And we are just about to mount next set in Kalimok. Use of protectors brings a clear benefit to electricity supply operators as well, as they prevent network incidents caused when birds come in contact with conductors on the poles."



The pole with mounted protectors (Photo from the presentation „Experiment in PP Rusenski lom, by ing. Tsonka Christova)

The Protected Area is also a Natura 2000 zone, which dictates certain behavior: no development is allowed and everything must remain as it was. It is not possible to apply even measures that would slightly distort the state of the local nature, for example, to build a rock climbing trails. Well, that is the theory... Do the rules of Natura 2000 specifically mention monster trucks and off-road racing machines? No? So let's make a 30 km long racing course on the very edge of the Natura 2000 zone, in the vicinity of the village Sredna Kula and near the Danube and Ruse. And let's organize there at least one big event each year. It happened only once that the guys who had that idea notified (mistakenly) the Club and even sent to them a map of the event. Emilia and Milko at that time were still working in the Park's Directorate and could rely on its authority to stop the race.

When we speak of problems, one thing to mention is groundwater. There was a World Bank project that sought to bring more water into the area by cutting the Danube embankment. It was achieved through 2-3 subprojects (which also led to the creation of the Belene-Persina Protected Area), but local farmers and hunters were not delighted to see that since that time water levels were regulated by the Nature Park Directorate (like on Persin island).

Other problems include initiatives and lobbying to build cumbersome renewable energy sources in the Danube waters, as well as (sometimes) people who seem unwilling to accept a simple fact that it is not allowed to build a house in a Nature Park. There also those who erect fences around their properties to protect them from deer and other wild game, which is also strictly prohibited in Nature Parks.

„In the past, the Nature Parks in Bulgaria were connected into a strong family with good internal cooperation. But some five years ago, big investors pounced on all types of eco-organizations who were a hindrance to their ambitions, labeling their network as „The Green Octopus“. The campaign in the media was strong and promoted an image of NGOs as hotbeds of corruption.

It is therefore quite difficult now to work in the environmental field as we are seen as “bad guys”. But we have trust in the EU, which recognizes causes and consequences and constantly pressures our Government to do their job. It looks like ‘you said you would do this, and you promised that you will do that - what is going on with this, and what is going on with that?’ :)”

Back to the DANUBE parks CONNECTED, Emilia mentioned that the project activities gave her chance to visit Hainburg and Haus am Strom. She would like to see Visitors Center of the National Park Donau-Auen, as there is an ambition to have something like that in Barslen.



Mr. Dimcho Petrov, Mayor of Braslen

I went back to Dimcho Petrov, an interesting person himself. He left his career as a TV personality in Ruse and an author of documentary films (I recommend the **Rock monasteries of Bulgaria**) in order to become Mayor of Braslen, just like his great-grandfather Lazar who performed the same duty in 1911.

“Our main problem here is that the wetlands along the river are owned by a state-owned irrigation company. The municipality of Slivo Polje has 11 populated places and 27 km of Danube coast, and we want to develop river and fishing tourism in order to attract guests. But we do not have any influence on the state, appearance, and contents on the Danube bank. The infrastructure is a major problem: a good quality road along the embankment is the basis for the development of these two types of tourism.

Another example of an unbelievable state of affairs is this: “Protected Area” means, among other things, that forestry works, drainage, and disturbance of the water regime, as well as the conversion of meadows and pastures into arable land - are all prohibited. But there is heavy machinery of a private firm that is working in our floodplain right now, destroying the

paved embankment road and leaving tracks in the floodplain that are sometimes deep up to the waist. This happens because it is possible for private companies to lease the area from the state, and then to exploit the timber there.”

But while waiting for changes in the bureaucratic labyrinth Dimcho does not lose his enthusiasm for Tourism development, especially the organized type of tourism:

“Since 2016 we regularly have scouts from the cities of Ruse, Varna, Plevna, and Schumen. Last year we even had a group from Belgium, in a camp organized in front of the Center (only their doctors stayed in the accommodation). They came here on the invitation from our domestic guests - scouts who were very satisfied with their previous experience here.”

“Our typical camp lasts 10 days and during that time participants go to the Danube on kayak tours, learn survival skills in nature and get acquainted with the values of the region, its birds, plants, and fish. Groups have 40-100 people and come in June and July.

We have another tourist event in August: it is one-day (happens on Saturdays) Fish Festival that attracts as much as 1000 visitors from Bulgaria, Romania, Czech Republic, and Croatia. There are competitions for the best fish stew, baked fish and home-made brandy, as well as for the fastest cleaning of fish.

As of 2018 we also have art colonies and one of them deals specifically with graphics - the authors were from Bulgaria and Romania. The theme is appropriate: nature. And works remain in our village gallery, accommodated in the Center.

Off course, cycle tourists can also camp or use our accommodation capacities. We plan to offer ten rental bikes in the village as well.”

As Dimcho explained to me, to the east of the village (in the direction of Nova Černa) there were abandoned fish ponds. But after opening the embankment in three places during mentioned projects in 2007-2009, the ponds are again in use as they fill up when the water level in the Danube is high. (When the Danube is low, the sluices get closed.) The fish are breed and then released into the Danube.

“Tutrakan is a tiny but famous fishing town. But before and after WW II they obtained most of the fish from wetland - after WW II this was just raised to a serious industrial level. Production, however, stopped in the late 1980s and early 1990s. (Bulgaria previously had even large vessels for sea fishing - they are all gone now because the need for fish somehow has decreased.)

In the 1950s and 1960s, Russians built the largest pumping station in Bulgaria (perhaps even all over the Balkans) between Ryahovo and Barshlen (and named it “Stalin”), to provide agricultural irrigation to the area. But its electric motors consume a lot of electricity and hence it would be too expensive today to irrigate fields with the Danube water - the solution is to use groundwater for that purpose. Research has shown a fascinating thing: at a depth of 100-120m there is a complete underground river that has no connection with the Danube.”

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In the meantime... the sunset in the Kalimok-Braslen style

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area. But its electric motors consumed a lot of electricity and it would be too expensive today to irrigate fields with the Danube water - the solution nowadays is to use groundwater for that purpose. A fascinating thing is that at a depth of 100-120m there is an underground river that has no connection with the Danube.”

SREBARNA NATURE RESERVE The silver oasis on a long way

A nice early morning saw me pedaling uphill, above the highest roofs of village Srebarna (meaning „silver“). The end of the road was taken by an inconspicuous concrete building: the Administration of Srebarna Nature Reserve. I was met there by **Mr. Momchil Petrov**, a biodiversity expert at the Administration.

The reserve covers an area of 895 hectares and includes the lake and the area to the north up to the Danube, plus the forested Devnya island on the Danube which belongs to Bulgaria. On the Romanian side is Ciocănești Protected Area with another island, so the whole area is one big green zone.



On the top of the Reserve's administration building: the best viewpoint in Srebarna village

The lake and the close zone around it (i.e. the Reserve) is under the highest degree of protection and even scientists can enter it only with the permission of the Ministry of Environment and Water (Ministry of Ecology). But entry to the outer ring, i.e. surrounding terrain, is not restricted. And there is an eco-trail that goes around the lake.

The reed and islands on the lake are actually not fixed – they are afloat. When the water level is low they run around, but when there is enough water wind pushes them around.

“In Bulgaria, Natura 2000 occupies a large part of the country – the aim is to maintain the existing status quo: if there was agriculture to keep that agriculture and if there were forests to keep these forests”, says Momchil.

“This is also Natura 2000 zone, plus we have a buffer zone on the east and west side of the lake. The main reason for the protection is birds. But even the lake, located along the Danube, is unique of this type in Bulgaria. Its depth is 2 to 2.5 m, with maximal depth of 4 m.”

“A total of 220 bird species (both nesting and migrating birds) are registered in the Reserve. We have a Dalmatian pelican colony with 60-70 nests, and it is easy to spot these birds that can live up to ten years and are the largest sort of pelicans. Then there is the Little Cormorant, the Greylag Goose, the Marsh Harrier, the Bluethroat, many species of herons. The Great White Pelican is visiting us during the summer – last year we even had a few nests but there is one left now.

During the winter we have migratory birds. Thousands of white-fronted geese – ,maybe close to 10,000 of them – are wintering here. The Mute swan

winters here too, but we also have more than 100 permanent nests of this bird. About 90% of the lake freezes during the winter and there are no insects and bugs, so it is harder for birds to find food.

As about fish, we have Crucian carp (*C. carassius*), and a lot of pikes. Fishing is only allowed with a hook, and out of the Reserve. But there are poachers: they cast nets at night in the central part of the lake (these are mostly people from the village and couple of them and already well known to us) or in its eastern part (these are usually “visiting” poachers). We inform the border police about all such events so that they can investigate and arrest the perpetrators (we do not have that legal option).”

I asked about platforms for birds and Momchil confirmed that there were four of them:

“Three of our platforms are used by pelicans, but the fourth not that much – for some reason it doesn’t attract the birds.

The problem with implementing platforms in our conditions is that the bottom of the lake is muddy and not stable enough to retain pillars of the platforms. And if we install the platforms on floating islands, they would get damaged when islands collide.

Platforms are safe zones (especially birds’ eggs), protecting from jackals and wild boars. At the moment there are even three racoon dogs here (a racoon-like animals that came from Asia). They are dangerous when the water is low and they don’t have to swim far to reach pelicans’ nests, but generally they do not pose too much of a problem: we see them more often this year, but we had similar situation last time in 2011. Hunting (with permission) for all these predators in order to limit their numbers is only possible in winter, when the lake is frozen.”

Very important thing for living world of the Reserve is that Lake Srebarna (which is of natural origin) is very stable: two years ago, many lakes in the country with similar size dried up, but this one was holding well. In the more distant past, the lake began to critically dry up in 1947-1948. Fortunately, the construction of an embankment for flood protection that led all the way to Silistra, began at the same time - that embankment also saved Lake Srebarna.

In 1977, a 500m long part of the embankment was lowered, thus forming a "step" over which the water from the river could enter the lake when the Danube is high. When the Danube is low, the step is high enough to prevent water from the lake to return to the river.

A canal with two sluices was constructed on the east side of the lake in 1994. (The building of the Reserve's administration was also built that year.) It is lower than the „step“ in the embankment and is used for an active regulation of water level in the lake. Sluices are generally opened when the Danube is high (in spring) and closed when the Danube level drops (in late spring or summer). The current information about the river level is obtained from the Danube Research Agency. In practice, opening and closing is done not only twice, but several times during the year.

Another critical period was from 1992 to 2003, because the water level of the Danube was often low. But since 2006 (when we even recorded the highest level of the lake), there is always enough water and the lake is healthy and fine.

There are no hydroelectric power plants (i.e. barrages) from the Iron Gates to the Delta. The Danube is very wide here and has only a slight drop, so it flows slowly. The sediment is mostly sludge, but the river water is clean. Sand is extracted a lot for use in construction,



At the southern end of the lake the floating islands stick one to another and form a "continent" :)

which of course isn't good from the ecological side. But the need for construction is stronger than the awareness about the need for nature conservation.

The riverbed is rocky and the erosion is not significant, but the phenomenon of the Danube burying into its own riverbed is present here too: since the time when the Iron Gates power plants have been built, it accumulated to one meter. The river is also slightly moving towards the Bulgarian side.

Activities of the Reserve also include conservation and revitalization of local flora: "Our strategy regarding the forest fund is to remove new, non-domestic species and to replace them with indigenous ones: white and black poplar, field elm and field ash. A few years ago, we removed the hybrid poplar from the zone along the Danube embankment and planted some of the mentioned species, adding some oaks as well."



Srebarna Museum and Info Centre



"Non-domestic species, such as *Acer negundo* and of course the inevitable *Amorpha fruticosa*, are invasive and difficult to eradicate by field machinery alone, so we strive to exploit any natural weakness of them. *Amorpha fruticosa*, for example, does not grow well in a shade and can be suppressed by planting taller trees in the zone that it attacks. So, in spaces occupied by *Amorpha fruticosa*, we first clear an area of 4-5 square meters and then plant there willows or poplars. And if we speak of slower and more laborious methods, manual extraction is better than cutting because the aggressive plant will not return as quickly."

There is a museum with an Info Center nearby but it is a separate institution: "We are 'protection' guys, subordinate to the Regional Inspectorate of Environ-

ment and Water from Ruse (which in turn belongs to the Ministry of Ecology). Our staff consists of one expert (me) and three guards, equipped with four off-road vehicles. (Well, three are functional and two of them are Russian "Lada Nivas" :)"

Momchil's life pace is determined by his job: "I live in Ruse and work here four days a week, Tuesday through Friday. My duty is, first of all, to organize and supervise visits and work of scientists and other guests. But you need to be versatile here, and I also work on management plans implementation."

Our other important activity is the daily monitoring of Dalmatian pelicans. And in accordance with the annual monitoring plan, we do the same for some other species. There are always additional teams from

other institutions - Academy of Science and the like - who also monitor water aspects, plants... 2-3 times a year. We monitor level of the lake on a daily basis, using an automated system. Plus: we are engaged in increasing the forest fund and in general water management."

This is not a working place that will take you around the world ("I visited the Delta, but we basically do not have a practice of visiting other protected areas") but this is not the point after all - there are other reasons to be satisfied with your job: "For me, the most important result that we achieved here is the fact that you can see the Pelicans so easily - that means there are many of them."

SMALL WETLAND OF BRĂILA NATURAL PARK Floating rangers and angry poachers

One thing that I liked a lot on this long journey was that despite the fact that all the head offices of national parks and protected areas shared the same idea, had the same reason to exist and were situated on the same green-blue line - each of them was different and original in its own way. And once more I wasn't disappointed when I arrived at the address of this Natural Park's headquarter: this large, three-floored Thing from the photo below was merrily floating in the harbor of Brăila. And I could imagine my host, **Mr. Bogdan Albu**, being gently cradled somewhere up there.

How long do you enjoy this cradle... I mean, how long do you work here?

"The Park was established in 2000, but since 2004 we have our own administration and I've been here since that time.



In 2001 the Park was declared as Ramsar site, i.e. a wetland of international importance. The ground for that was that it preserves nature on 25,000 ha of wetland, with birds as a primary value. Cormorants, pelicans, white and gray stork, wild ducks... There are also 10-15 white-tailed eagles (the number changes from year to year). And let's not forget: we are members of the DANUBEPARKS Association."

It is definitely nice to work in an office positioned directly on the Danube?

"This spacious floating facility with exhibition space, conference room, and our offices was provided through an infrastructure program conducted in 2012-2015 and financed by the EU. It was built in Giurgiu (Romania) and delivered to us at the end of 2015. (and it is not a boat - it doesn't have engines). Before that, we were accommodated in Brăila Forestry Directorate. Our permanent exhibition that you can see on the ground floor was also created in the frame of the same project."

Let's talk openly now: if this is the Small wetland of Brăila, where is the Big wetland of Brăila? (Better admit if you try to keep it a secret, in order to retain here visitors like me.)

"The history goes like this: in the 1960s and 1970s there was a huge single island here - the Great wetland of Brăila. However, due to the construction of irrigation canals combined with the widening of the Danube, the island was divided into one large and several small parts. Most of the large part was then drained and become an agricultural area (it was bought last year by a Saudi Arabia investor) - that's why there is no Big wetland of Brăila.

The smaller parts formed eight islands, and that is the territory of our Park today. It was preserved as a nature value thanks to the fact that after 1990, with the end of communism, the ecological awareness

has grown, modeled after good examples from West Europe. But still: the Great wetland of Brăila had an area of 160,000 ha, and after mentioned hydrological works it was reduced to present area of 25,000 ha."

The size of the remaining part has to be accepted as some kind of consolation: it is big enough that it can't be completely seen in one day. Take look at the maps below: the straight distance from the top (Brăila zone) to the bottom (Magureni village in Dobrogea) is 50 km.

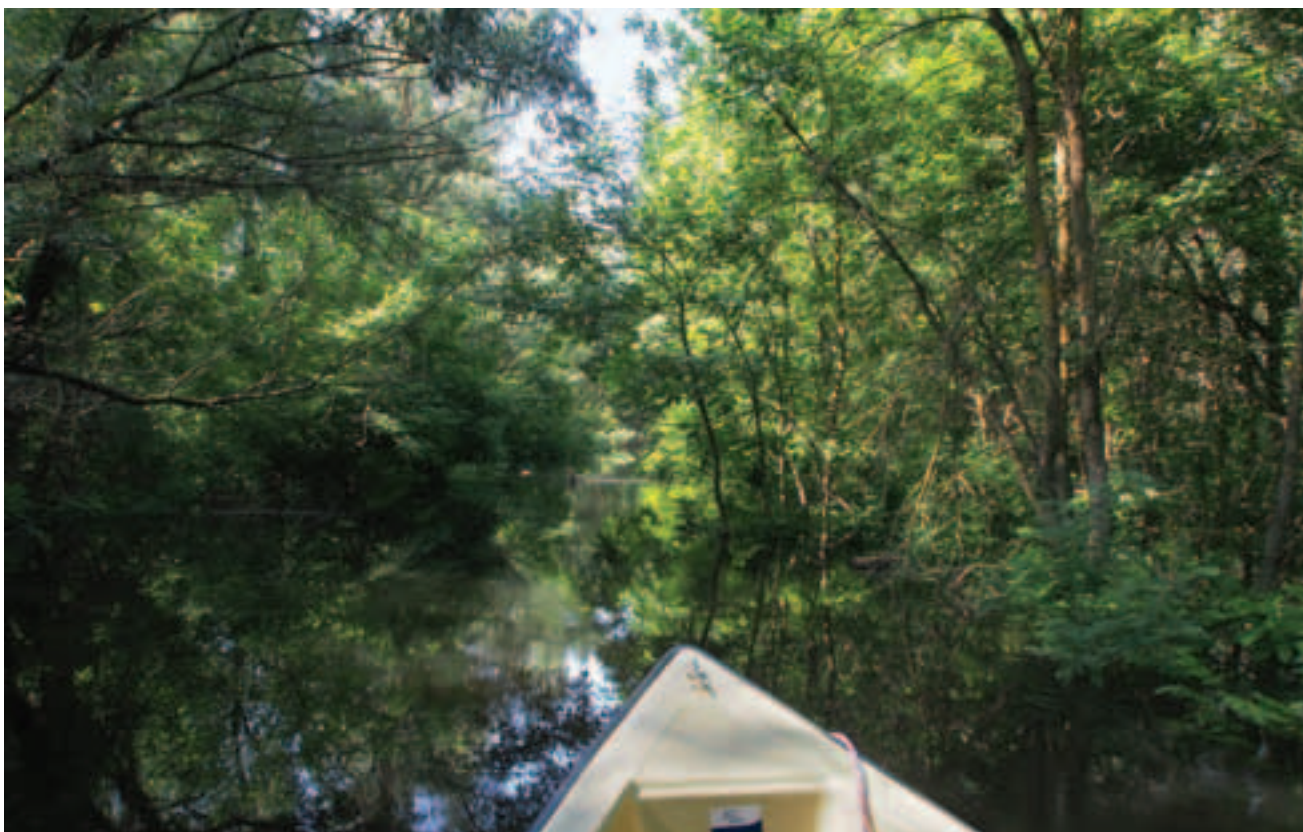
To better understand the structure of the Park, one needs to know that there are there levels of nature protection in Romania:

- Buffer zones;
- Strictly protected zones (visit is possible after an announcement);
- Integrally protected zones (entering possible only when accompanied with rangers, the only form of tourism is visiting, no other human activities allowed.)

The Park has two integrally protected zones and a buffer zone on the Danube bank. The rest of its territory is under strict protection.

The plan for my visit was to have a boat ride in the northern zone of the Park. And it turned to be a really great experience. We first glided downstream for a couple of kilometers, then turned into a narrow channel full of mosquitoes that led us into the inner water world of the Island Fundu Mare.

"If the Danube is high in November and December, then water remains in this lakes and they completely freeze during the winter. Otherwise there is no water in the lakes during the winter and they can be crossed on foot. That is when game appears here - deer, wild boars, rabbits, beavers (they come when the water is shallow, 1-1.5 m) and even cows pay visit.", said Bogdan



Though the narrow channel, towards the inner lake of the wetland. The canal is the only way to get there. In times of high water, it is changing every day and can be blocked with fallen trees or branches.

“On the Park’s northern island, Fundu Mare, we use an embankment with a metal sluice to regulate the water level. After 4-5 unsuccessful attempts to build a permanent embankment using only local materials (wood and stones), a certain amount of concrete had to be added. Another embankment with a sluice is positioned in the south end of the Park (near the village Mărașu) and regulates the water level in a zone which is under special protection regime. We open and close these sluices several times a year in order to keep water in the wetland as long as possible:

when there is water there are fish and when there are fish, birds have a reason to stay. We monitor the water level manually, by direct access.

To provide even more water, we created a channel in the southern part of Island Fundu Mare through the LIFE project. That channel reduces siltation of the lake. During the dry season in 2009, we used mechanization to deepen the canal by 2.5 m. The work was carried out on a 400 m long stretch and lasted eight months. The result is that the water remains in the

lake one month longer than before, usually until late fall. (The lake then recharges in the spring.) But the process will have to be repeated every 10-15 years.

The year 2010 was historic because the Danube reached a water level of +700 cm (at the time of my visit, after days of heavy rains, the level was + 586). Some communities were flooded and the entire island Fundu Mare (i.e. the northern territory of the Park) was under water.”

“Besides nature protection and conservation, our main additional activities are monitoring of the protected area and prevention of poaching. Fishing is only allowed in the Danube and not in the Park area. Poachers looking for anything they can get, and the preferable catch is pike and carp eggs: they are source of a sort of caviar that is cheaper than the one obtained from sturgeons. Most of the poaching happens from the end of April to the beginning of June because that is the reproductive period for most fish species. Fifteen years ago, poaching was a big problem because we didn’t have the necessary equipment nor enough staff. We now have eight rangers and four motorboats.

A good thing here in Brăila part is that it is hard for poachers to enter the inner lake of the wetland (the most precious part of it) because it is naturally protected: the only entrance/exit is through a channel that is used by tourists and rangers - there are too many witnesses to run into.

Our rangers are at the same time our security personnel and our tourist guides. Actually, everyone here must be ready to perform more than his basic duty - I am an IT engineer, but also a guide for foreign groups.”

“As for the forests, we replace the American and European poplar (white, black) with white willow. And we gather seeds of different tree sorts. We also suppress the aggressive *Amorpha fruticosa* on an area of



The inner world of Island Fundu Mare. The depth of the lake is 2-3 m and 1-1.5 m in the average. (The depth of the Danube in Brăila zone is 10-15 m)

200 ha (the first phase was through a pilot program and after that we worked through the LIFE program). We do not just cut that plant, but completely remove it during the autumn and winter when the terrain is accessible. (Although I can mention that beekeepers love *Amorpha* because bees make beautiful honey from it.)”

“Our annual number of visitors is 10,000-12,000, and they mostly come at weekends. We have a steady increase in foreign visitors numbers: their share is now at 20-30% of the total visits. Twenty-five percent of foreign visitors are experts and 75% of them are tourists from cruise ships who come to us during their typical two-day stay in Brăila. A word about us is expanding very quickly and there are already plenty of tourists who come to Brăila especially to visit us and then the Danube delta.

We plan to provide a special service boat to clear the grass in the lakes and to maintain a “road” for canoes and small boats with visitors. And we also hope to have soon one tour boat with the space for 18 persons.



There is a study trail on Island Fundu Mare that is a couple of kilometers long. At the moment info boards and signposts are removed due to the high water, but will be returned in a period when one can walk along the whole trail (usually from September).”

I asked Bogdan the standard question about success:

“The way I see it, we achieved two important goals here:

- Large reduction of poaching, which was a big problem in the past as offenders used to enter lakes and to cast their nets that were harming birds as well. We have practically eradicated this crime in the last 10-15 years.

- Educational activities in the local community, with a „from tail to head” approach: we increase awareness of children that it is good to protect nature and then let them pass that attitude to their parents. Children come here for presentations and lectures, but we also visit local communities with this program. We also produce textbooks for young children.

As for our general status in the local community, there is sometimes a bit of resistance towards some of our actions and rules, but it is not a significant problem.

LOWER PRUT BIOSPHERE RESERVE

Visiting a relict of the Danube

To visit this reserve I left the route to Tulcea for a couple of days and cycled north on Romanian side from Galați to Oancea, then crossed the border with Moldova and ended in town Cahul. Next morning I went to the central city square, to meet a group of local cyclists and my host Anatolie Risina, project manager.

We cycled from there back towards Galați but this time on Moldova side, along the Prut basin. It extends to the south-east and the terrain is kind of flat but with many small hills and with maximal elevations of 120-140 meters. And so it was along the way: up-hills and downhills were following each other.

The Prut river forms terraces with ponds and couple of big lakes. In the upper part of the river, large wetland areas had been dried out for agricultural purposes in the 1970s, which of course reduced habitat space for many species and changed the hydrological regime of lakes and wetlands, etc.

The lower part of the river remained relatively unchanged and retained most of its original forest ecosystems, grass meadows and wetlands. To protect and upgrade these natural values, the Lower Prut Nature Reserve was created in 1991. Approximately one third of the Reserve was occupied by Lake Beleu - a several thousand years old relict of the Danube.

At the end of 2015, the local Council of Cahul district in agreement with local communities declared the status of Biosphere Reserve to the rest of Lower



Prut valley, covering an area of around 14,800 ha. It is now a protected zone with limited access, mainly for research activities.

The Reserve now includes floodplain lakes Manta (1880 ha plus 3239 ha of wetlands) and Beleu (960 ha plus 2285 ha of water ecosystems). Both of them are Ramsar sites.

Riparian forests occupy in total 10% of the territory of the Reserve. Since 2000, according to an agreement signed by Romania, Moldova, and Ukraine, the Lower Prut has a status of the green corridor between these countries.

The ecological importance of the area is recognized nationally and internationally. And it practically represents an entrance to the Danube Delta Biosphere Reserve: it lies on the route of migratory birds and offers resting, nesting and wintering space for more than a hundred bird species. More than 50 of these species are listed in the EU Birds Directive, in the Bern Convention and in the Red Book of the Republic of Moldova.

Local economic is mostly related to fishing and agriculture. Agricultural land along the Prut is cultivated mostly on traditional ways and properties are small, usually tied to households. Produced crops have



The buffer zone of the protected area is also covered by water ecosystems and meadow vegetation

good quality due to low use of chemicals and due to the fact that wheat and grape, cereals, vegetables, and other crops are native species. But agriculture provides a modest level of living standard to local people who sell their products on markets in Cahul or in Romania, and it is a constant struggle: the average general income is about 100 EUR a month per capita. Prolonged economical crisis leads to depopulation of the area and it is estimated that 30-35% of local people work abroad on a permanent or temporary base.

I asked Anatolie what are expectations of this brand new reserve in the light of the mentioned situation:

“The Reserve can promote the development of organic farming as well as cultivation and labeling of local quality products, and thus can foster social and economic development. Estimations predict that the area for that kind of farming could be around 3000 ha in the Reserve only, some 500 new jobs would be created, and the resulting increase of the average lo-

cal income would be about 20-25%”, says Anatolie. “It should also inspire the development of rural tourism in the region because there is a good base for that.”

The tourism potential is real, with the urban population from Moldova and Romania as its target group. Data show that in 2012 and 2013 there were circa 12,000 visitors who stayed in the region 3-4 days, mainly in private accommodation of a decent level. The estimated benefit was a 40-50% increase in family budgets. Local population is definitely more and more aware that the Biosphere Reserve has a positive influence on that trend.

There is an important plan to recover reed belts in the lower part of the Prut river in order to restore habitats in the Reserve. This would also improve water quality: studies show that the level of nitrogen in water ecosystems would be decreased by 30-40% and level of phosphorus by 40%, thus reducing eutrophication (excessive growth of algae and other plants due to a high content of minerals and nutrients in the water). The restoration of the reed belts would be applied in the area of around 10,000 ha and great part of investment could be returned by using obtained material for heating, in construction, etc.

The first lake we passed was Manta. During the Soviet era, this and some other lakes were used as industrial fish breeding ponds, but in the last 25 years they are used for that purpose only by local population and on a small scale. According to last research studies, the fish diversity is improving.

Both Manta and Beleu are shallow (the second one has an average depth of only 0.5-1.5 m, with a maximum depth of 2 m). The north side of Manta always has water, and its western part is mostly dry. But this year, due to a lot of rain, there was 1-2m of water even in the western part.



The second lake that we passed was 5 km long and 2 km wide Beleu. Since 1991 the lake and its adjacent area are a strictly protected zone, with the goal to protect water-based species. The regime was declared by the Government of Moldova and is controlled by Cahul regional environmental Inspectorate. But commercial interests have an advantage over nature

protection and there is an intensive oil extraction activity in the lake zone: oil fields cover around 30% of the area and boreholes that are located mostly in the upper part of the lake give around 30,000 tones of oil per year.

I said goodbye to Anatolie and my cycling friends in the small town of Giurgiulești (that has the largest port in Moldova) and went back into Romania, right into the black wall of a torrential downpour. There was an irresistible joy in the form of a roof above my head in the nearby Galați, and the last part of my journey along the Danube had to wait until the next day.

THE DANUBE DELTA BIOSPHERE RESERVE Biospherical Danubean Fina- le Reserved for The Delta

For the third time in the past five years I cycled up the last of countless hills on the 80 kilometers long road from from Galați (yes, this leg is quite strenuous), entered the first streets of Tulcea and then quickly descended through the sunny afternoon to a long, lively, charmed promenade along the Danube bank.

For those who want to ride the full length of the EuroVelo 6, this is not the end - there are couple hundred kilometers left to Constanța. (And one has to bear in mind that the EuroVelo 6 is not only a route along the Danube: it starts on the Atlantic ocean and goes to the Black Sea). But for those who wish exactly to follow the Danube from its spring to its end (and they are the majority), Tulcea is the right address. To be more precise, it is the best address that you can get: the Black Sea shore is still 80 kilometers away, and to go there you will have to take a boat to reach a tiny town Sulina at the end of the central channel in the Delta. Is it disappointing thing after cycling three thousand kilometers along the Danube? Not exactly: from the pier in Sulina you can proudly pedal four kilometers to the warm, white sand on the local beach, and that's it: there is a small wooden dock there, that will allow you and your bicycle to pose for that perfect photo right above the waters of the Black Sea :)

A crescendo at the end of a classical music piece is a demanding and dangerous challenge for a composer. It must be no less than a perfect culmination, grandiose enough to meet all of our ruthless expectations after listening to so many tones before it. An ungrateful



At the end of the stunning online game. "Online" means on-the-line-of-the-Danube :) The task was to collect magic keys by touching these identical sculptures of the sturgeon - the first copy was in the yard of the Danube-Auen National Park, downstream from Vienna. Alas, I discovered in Tulcea that I didn't completed the challenge: somebody told me that there should be one more sculpture somewhere in Bulgaria. This means that I will have to travel along the Danube again.

task, and there is no mercy: the result makes the difference between being a craftsman or an artistic genius. It is this-or-that, there is no compromise.

But the Danube Delta does not care about rules of classical music: its composer was an emotionless (although infinitely persistent) craftsman, but the result is ingenious. That is what Nature does: it blindly and indifferently composes places and then leaves them to us, to adore them and to project into them what

we want to see as an imprint of a genius. The Delta does not disappoint in that sense: it is a perfect crescendo at the end of the Danube Concerto.

The Danube Delta is the largest wetland in Europe - it covers an area of approximately 4,300 square kilometers. This gigantic labyrinth of countless lakes, channels, and islands at the end of a 2,860 km-long river is shared between Romania and Ukraine. Much of it (approximately 1,700 square kilometers) is over-



The view of Tulcea with my hosts Garbiela Morozov (left) and Gabriela Crețu (right)

grown with reeds and it is the biggest reed bed in Europe (and probably in the world). This natural filter also makes it Europe's largest water purification system. Since 1991 the Delta has been on the UNESCO World Heritage List, and in 1992 was internationally recognized as a biosphere reserve.

Needless to say, it is full of life. There are 312 important bird species and most of them use the Delta as an important stopover or as a breeding area. There are about 90 fish species, including globally threatened ones (for some of them this is actually the last refuge), and over 1,800 insect species.

The three main arteries of the Delta are its big channels that form the basic water structure of the area. And all of them start from Tulcea: Kilia (Ukrainian), Sfântu-Gheorghe and Sulina branch. Everything else is entwined between these three final branches of the Danube, of which Sfântu-Gheorghe is the oldest one. While slowly making their path through the Delta, they divide into many smaller streamlets which end in wetlands and lakes. The river sediment mixed with the sea sand forms large sand ponds and islands. Some dunes, like those on the Caraorman sand pond, are up to six meters high and look like real desert dunes.

The history of the Sulina branch was shaped by pirates and clogged with shipwrecks, then framed with Turks and Russians who fought a war there. But after the Paris Conference, it was chosen to be a major waterway in the Delta and rectification works lasted from 1862 to 1902. The branch was shortened from 103 km to 70 km by cutting through its six meanders. The town Sulina became Porto Franko of Romania and was chosen in 1952 as a seat of the Danube European Commission (many see it as a forerunner of the European Union).

Romanian partner in the project DANUBEparksCONNECTED is the Danube Delta Biosphere Authority (DBRA). So their head office and Visitors Centre in the middle of the Danube promenade in Tulcea was my starting address. My hosts and guides for the next two days were The Two Gabrielas :) - **Mrs. Gabriela Crețu** (Project Manager) and **Mrs. Gabriela Morozov** (Assistant Manager). They introduced me to the basics:

"We are a public institution, subordinated to the Ministry of Environment and founded in 1990, at the same time when the Danube Delta Biosphere Reserve was established. Our responsibility is administering, protecting and conserving the natural heritage of national interest, as well as physical and geographical units in the Reserve.



This includes establishing (together with state authorities or independently) regulations and controlling navigation and access on the Delta branches and inner lakes for all kinds of vessels. We also support and encourage sustainable use of natural resources. And finally, we offer management, education, training, and other services.

The Visitors Centre is a reach source of information on what to see and do in the Delta, and besides other material offers our Guide of the *Touristic Routes*, which describes 19 aquatic routes."

The cultural heritage of the Danube Delta is defined by the fascinating mix of Romanian, Gagauz, Lipovan, Moldavan, Russian, Ukrainian, Bulgarian and Turkish people who live their hidden lives scattered around in tiny villages. In recent times tourism appears as a new important economic activity after traditional fishing, hunting, reed harvesting, livestock raising, and modest agriculture.

"The population of the Delta (including Sulina with its 2000-3000 inhabitants) is 11,300. For most of them, life in the Delta is not easy. In winter, most channels are frozen - and they are the only "roads" to Tulcea. Therefore, in such times large icebreakers have first to break the ice and then ships with food and other supplies can follow them. The water level in the channels sometimes can be too low even for small boats, but the problem will be the same: how to reach Tulcea?"

The Reserve covers an area of 580,000 ha. "The 'Biosphere reserve' means there are both nature protection and cultural heritage protection. There are only two or three reserves in Romania with that concept", says Gabriela Crețu.

The highlight of the first day was the four-hours long cruise in the channels north of Tulcea. We went north to the Kilia branch and the border with Ukraine, then turned back.

The minimum water depth for ship navigation is 7m and must be maintained as such. From the shore of Black Sea to km 48 of the Sulina channel the distance is calculated in miles because this part is considered to be still a marine zone. That is how a couple of locations along the channel got their names: for example, village Mila 23 (*) is located 23 miles from the mouth of the channel.

() By the way, this tiny village that is lost in the endless greenery of the Delta is the birth place of Ivan Patzaichin (originally Russian Dabovan) and the legendary canoeist who won seven Olympic medals (four of them gold) at five consecutive Olympics (1968-1984) plus 22 world championship medals.*

There are several main bird migration routes in Europe, but this is the one that Dalmatian pelicans use: the Delta - Bulgaria - Greece - Ukraine. LIFE project in 2006-2009 had the goal to save colonies of these birds and the area was declared as strictly protected. Two nesting platforms were built there and maintained regularly each year. It is also worth mentioning that half of all pink pelicans in the world breed in the Delta.

Is there poaching here? "Of course. Locals do it for centuries, but the worst pests come mostly from Bucharest and use sophisticated technology - modern boats with powerful engines, sonars... That's why they can make a lot of damage in a short time. In order to prevent the damages, the DDBR has a special department that checks licenses of fishermen sighted on the spot."

The next day the three of us walked to the Monument of independence on the top of the highest hill in Tulcea, to enjoy nice view of the town. Another thing one could see from there was a "mini Delta" on the nearby Lake Sagen. It was revitalized during a Romania-Ukraine transboundary project which lasted from 2007 to 2009. Gabriela Crețu had a special feeling about it:

"It was the first project in which I participated in the DDBR. I was engaged in the creation of a feasibility study and technical documentation. Tulcea City Hall then started corresponding works, using EU funds for infrastructure and environment development. From 2009 to 2010, unsightly cottages around the lake (some kind of a slum) were removed and birds then returned to the lake. We call this complex "mini Delta" because it has characteristics of a model, with its small channels and ponds, just like the real Delta. It receives water through a canal that connects it to the Danube and the water level is regulated by a sluice.



To better feel the atmosphere in the Delta channels, it is really, really recommendable to watch movie "Fitzcarraldo" by Werner Herzog. It takes place in a labyrinth of Amazon channels, but scenes look exactly like this one. Including one of the main characters - the boat :)



The lake is not open to the public yet. According to the terms of the project, five years after its completion the only allowed activity is monitoring. We will probably make it available to the public after that period but for the time being, some festivals are being held on the perimeter of the lake, and at one spot the Municipality has reconstructed a typical fishing village with several houses."

There are only a few masters (so-called „marangos") nowadays who can build traditional boats of the Delta fisherman. The last one in Tulcea cooperated with above mentioned Ivan Patzaichin in designing an innovative combination of boat and canoe, "canotka". They now offer to tourists a small fleet of these boats and organize a race for fishermen, amateurs and children on the Lake Chiuperca on the Day of the Biosphere Reserve (September 1st). They also organize a triathlon and provide camp for visitors during the annual Pelicam Festival (what a great name!) of ecological documentary movies.

Below the hill, in the old Lipovans' quarter, there is a very interesting Ecotouristic Museum "3D Delta-Dobruja-Dobrogea". Mrs. Christina Dinu, the director at the museum, took us around and revealed to us with many curiosities:

"There are 20 strictly protected areas in the Delta. Letea Forest was the second zone in Romania declared as a protected area, and it is an enigma for biologists because it developed on the sand. (By the way, it is worth mentioning that generally virgin forests of Romania are found in the Tulcea County.)

The Delta was formed over two geological periods and was influenced by two main factors: the Danube and the horizontal currents of the Black Sea. One result of that is also that we have here our own version of the Great Barrier Reef: it is a Sand belt, off the Delta coast.

And if speaking about the three main branches, the branch of Sfântu-Gheorghe is the oldest and the most beautiful in the Delta.

The bottom of the Delta lakes lies below sea level and they actually don't have shores: what looks like that is just the edge of the dense vegetation. And that vegetation - reed above all - is a natural filter and retains heavy metals."

All this green spectacle staged by the Danube wouldn't exist without its other half, its epitome that gives the chance to incarnate into the phenomenon that we admire: the Black Sea.

The ancient Greeks at the beginning called this residual basin of the Central European Tethys Sea Pontos Axeinos, the Hostile Sea, because of its wild storms (when the waves can reach a height of 15 m) and lack of islands. (But after colonizing its coast they changed their minds and renamed it Pontos Euxeinos - the Hospitable Sea :) About 1,150km long and 611 km wide, it has an average depth of 1,300m while the maximum depth is impressive 2,245m.

During its geological history, it was a cruel mother to its children, changing the type of water from salty to fresh, then back to salty (and destroying its freshwater fauna). But because of the huge inflow of freshwater from several big rivers and semi-fresh water from the Sea of Azov, the salinity is decreasing again and now is almost 50 percent lower than the salinity of the ocean.

There are no vertical currents in the Black Sea and the quantity of oxygen decreases rapidly with depth. That's the reason for the absence of marine life at below 150-200 m, except for a few anaerobic bacteria. Deeper that, there is also too much accumulated hydrogen sulfide.

The museum also shows the values of the Dobruja region. It has always been strategically very important and therefore has historically been the most occupied part of Romanian territory. All five European bird migratory routes pass along that zone that offers food and rest to birds during their long journey to Africa and back. It is also the only pure steppe zone in Europe (but without typical steppe dwellers - wolves, who are exterminated). Măcin Mountains National Park is a zone with the oldest mountains of Romania.

Argamum Citadel near Jurilovcea is now the oldest settlement in the territory of present-day Romania. And there is a Greek, Roman, and Byzantine legacy in the small village of Murighiol which was at the heart of early Latin Christianity. Halmyris was a Roman and later Byzantine fort, settlement, and naval port, located 2.5 kilometers west of Murighiol, at the mouth of the Danube Delta. It is there that the bodies of the first Christian martyrs known in Dobrogea, saints Epictet and Astion, were discovered between 2001 and 2004. They preached the new religion around the year of 290 and fell victims during the persecutions ordered by Emperor Diocletian.

Tulcea is among the first spots in Romania when it comes to history and architectural values (together with Constanta).

*

The last evening of my more than two months long journey was surprisingly appropriate: Gabriela Crețu took me to a concert of classical music by the Constanta Philharmonic Orchestra. And yes, I heard there that perfect crescendo at the end of the Danube Concerto.

