



Aqualutra

Why and How the Otters were »photo-trapped«

LAYMAN'S REPORT
OF THE PROJECT
LIFE04NAT/SLO/000234



Our knowledge about the otter was very scarce since now. Characteristic for all species of mustelids, the otter also is mysterious and cautious yet curious; skilful and playful, almost weightless it is pushing through the water, as lithe as an eel; quick as lightning and ruthless when it grabs what it wants to catch; fearless and invincible when protecting its offspring. Despite taking the same tracks along the waters, only those observers with most persistence have seen it. Those who had luck enough have seen it when not expecting it. No wonder then, that people saw it as a water sprite or water nymph, even Nessie or some other local "aquatic" legend. In the course of the project LIFE-NATURA we wished to unveil some mysteries of otter's life.

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The rivulet Mala Krka under the village Križevci

1 From a railroad to the LIFE project

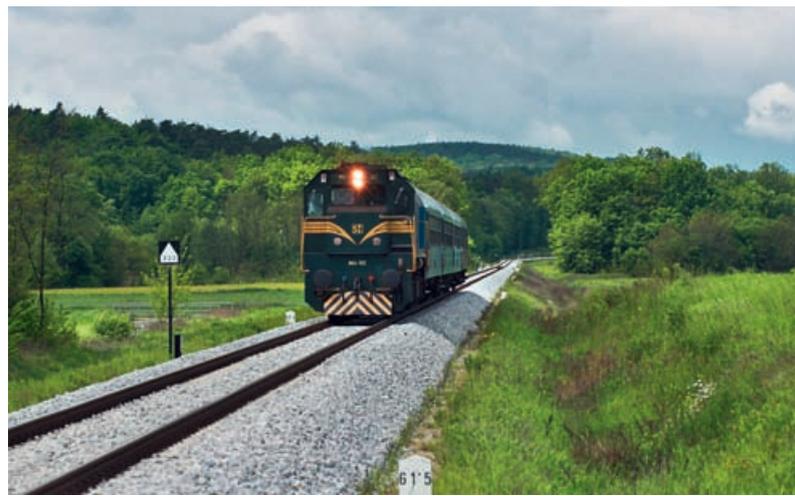
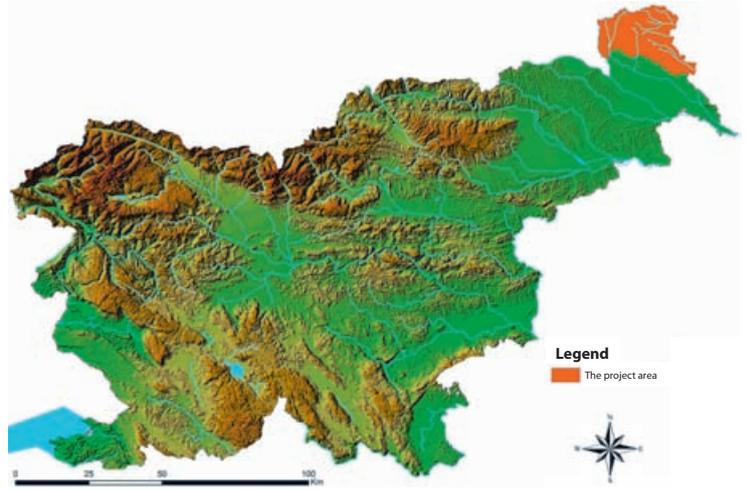
From the year 1999 to 2004 Institute LUTRA was carrying out the monitoring of the otter (*Lutra lutra*) and its habitats in the time of construction and first years of operation of the railway Puconci – Hodoš – state border. When it became clear that the railway with its rough constructing works in the main watercourses had seriously damaged otter's habitat in the area still hiding all the natural values necessary for proclaiming Natura 2000 area, the story of the otters in Goričko has commenced.

At first, we knew nothing but a fact that the otter appears quite often along the streams Peskovci and Mačkovci; most commonly, it was seen in the Lake Hodoš. Here and there, in a village pub we have heard the rumours, some fish were missing from a fish-pond or someone has mentioned, an otter was run by a car in the past. Has anybody ever seen it? Scarcely. It used to come to an old water-mill on river Krka, hunters have told us. Sometimes there were even two of them, playing and chasing around under old alder trees. But afterwards, the water-mill was reconstructed; the otters have vanished and so has the water...



Lutra prikázen hodošiersis

A "Hodoš spirit" has inspired the artist Ueli Iff.



It was not only the development the railroad has brought to Goričko...

Five years later, after LIFE project granted by European Commission and worth over a million € has ended, we know much more about otters in Goričko area. Even more important, also local people know this species much better, especially young people and decision makers. Otter is a constitutional part of the Municipality Gornji Petrovci's symbols (the coat of arms, the flag). In the valley of Mala Krka under the village Križevci, a new Otter centre AQUALUTRA has emerged; there, visitors of the Landscape Park Goričko become acquainted with and learn all about the otters. Goričko, up to now known as the most remote Slovenian region, in last years has become well-known as the »Otter Land« which is becoming more and more popular travel destination amongst foreign as well as local tourists. About this land and the "queen of waters" a documentary has been made and a lot of articles in newspapers have been published.



Hodoš Lake under the village Dolenci

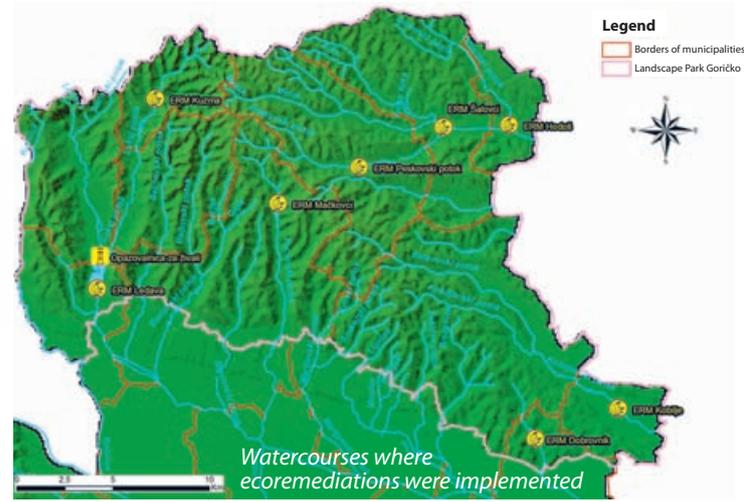
2 What was the aim of the project



Otter is known as a queen of waters and umbrella species of our freshwater ecosystems. With its charismatic image, the otter plays a very important role as a messenger in rising of public awareness for preservation of rivers, streams, lakes and also for wider environment conservation.

Eurasian otter (*Lutra lutra*) is listed on Bern convention (Annex II) and on Habitat directive (The Council Directive 92/43/EEC, Annex II, Annex IV) as an endangered species. Therefore, Republic of Slovenia as a member of EU is obliged to protect this species as well as its habitats in favourable condition.

That exactly was the aim of our project: to conserve a viable Eurasian otter population in the area of Landscape Park Goričko by restoring the most destroyed parts of otter's natural habitats and by maintaining the freshwater ecosystems at a favourable status. As we have assumed that Goričko is sharing its otter population with Austria (federal countries Steiermark, Burgenland) and Hungary (Zala megye), we have undertaken several mitigation measures to improve the connectivity of migration corridors on the area of Trilateral Park Goričko – Örszeg – Raab. Otter habitat restoration was also in favour of other water and riparian species. Some of them are important otter prey species. We have paid special attention to rare and threatened species.

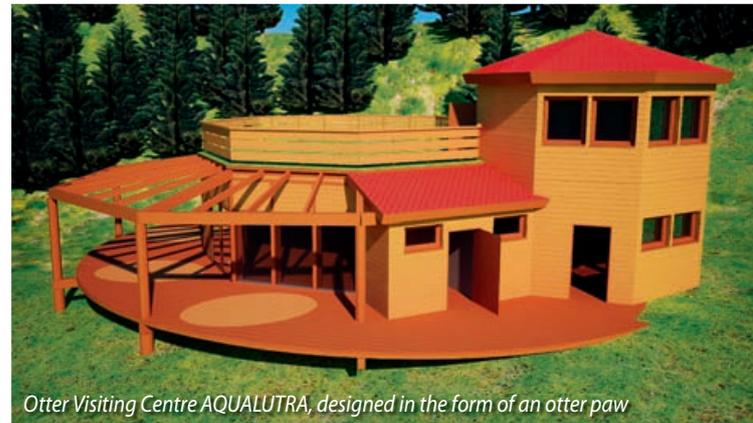


As otters are mysterious and rare animals, we tried to reveal as many otter secrets as possible. Modern investigation techniques, for instance radio-telemetry, could be dangerous for such animals. That is why we have decided to use a combination of different non-invasive methods for otter monitoring. We have endeavoured to estimate the approximate size of otter population, its sex ratio and age structure. Besides, we wanted to find out which paths (water corridors) are most frequently used by otters.

Public awareness rising and education of different groups of people were the most important aims of the project. They were designed for scholars, hunters, for other local and wider public groups and experts as well as for organized groups or individual visitors of Goričko Landscape Park. This is also the main mission of Otter Visiting Centre AQUALUTRA with belonging educational path along the stream Mala Krka. By accomplishing the project LIFE, activities in the centre are just about to commence.



The otters were caught by photo-traps - automatic cameras placed under the bridge



Otter Visiting Centre AQUALUTRA, designed in the form of an otter paw



Along the otter tracks



"Hopefully she will be waiting under the bridge, otherwise..."

3 What was going on for four and half years

Project LIFE comprehended 43 single actions with sub-actions. One of the main tasks was detailed survey of otter's distribution in Goričko next to ascertaining quality of otter's habitats (analysis of physical and chemical parameters of freshwaters, distribution of some prey species). At the same time, we were recording "black spots" on the roads where the otters were most jeopardized. Regarding this spots, an action plan for the whole project area was prepared; with different mitigation measures we tried at least to draw the attention to those points or even suppress them to a certain extent. We have adapted some bridges and underpasses; special traffic signs were placed over the whole Goričko warning the drivers of the otter presence. On chosen sections of watercourses in some municipalities, the quality of the streams was improved with ecoremediations as well as the banks were planted with vegetation on sections that were damaged directly or indirectly by construction of the railway. At the same time, we have demonstrated to local people and visitors how to use natural processes for improving mistakes done with inconsiderate interventions in the past.

The most interesting but usually also the hardest part of project was monitoring of otters in different ways: with the method widely established in Europe we were searching for tracks and spraints on otter marking sites. Otters don't hibernate in the winter time but rather they are very active marking their territories intensively. Winter is also their mating time so they are eas-



A plant waste water treatment system in the river Ledava is successfully growing.

ily tracked on snow. Otters are excellently insulated with thick water resistant fur, so cold doesn't do them any harm. It wasn't so pleasant for us when ice was broken under our feet...

To the most suitable sites under the bridges we have put automatic cameras connected with infrared sensors (phototraps) and thoroughly kept our eyes on water levels... In spite of this one camera was lost due to swollen waters of the brook Peskovski potok while the second was stolen.

How we were delighted when the first otter has appeared in the shot from Peskovski potok! After this many others came: we were following mother with three cubs, observing pairs in winter time and then, on the basis of data and time we tried to put together the otter's story. Besides otters, many other animals came to be photographed, too: badgers, roe deer, foxes, polecats, hedgehogs, even black stork! The majority of them, of course, were small rodents, cats and dogs.

In winter time we were picking fresh spraint samples for genetic analysis of DNA. Analysis was done in the genetic laboratory

of Department of Animal Science (Biotechnical Faculty). That way we got acquainted with Božek and Cvetka that were covering whole Goričko area, with Jagoda, who is probably aunt of Lili and Zlatko, and those two are brother and sister. Božek also has brother Rene and cousin Katka... 30 different animals were recorded in good three last years.

We have experienced also sad moments. Hunters delivered us two otter cubs found dead in vicinity of Lake Ledava. Using autopsy we found out both were killed by a bigger dog. In the first project year we also have found two cubs that has been run over by a car in the village Martjanci. If we take into account only these events otter population in Goričko suffered heavy losses in last years.



Putting the wooden nail into the riverbed



Indentation forming, using wooden piles

The most important event in the whole period of the project LIFE AQUALUTRA was EOW -**European Otter Workshop 2008** held in Moravske Toplice from 5th till 10th of October. It was a working meeting of IUCN/Species Survival Commission/Otter Specialist Group for Eurasian otter with more than 60 participants from more than 20 European countries. The Workshop with accompanying events has constituted the European Otter Month in the frame of which also the exhibition **The Otter Queen of Waters** was opened in the castle Grad in Goričko; during the summer 2008 the exhibition was invited to the castle Bistra (situated in the vicinity of Ljubljana) by Technical Museum of Slovenia. The panels rich with contents as well as pictures are complemented with taxidermic specimens of otters and their relatives (family Mustelidae) living in Slovenia. It has to be stressed that apart from two otter cubs all animals displayed were victims of traffic; with this, we wanted to pay the public attention, especially that of drivers, to the animals on the roads. With the opening of Otter Visiting centre in Goričko the exhibition has returned to Goričko where its mission will to be continued.

4 What we have achieved and learned

The biggest success of very extensive LIFE project is Otter Visiting Centre Aqualutra with educational path placed in the valley of stream Mala Krka in village Križevci, Municipality Gornji Petrovci. The Centre will make Life project continuation possible also after the project ending. Its purpose is education and awareness rising for different groups of visitors, primarily schoolchildren, as well as further research work. Namely, the conservation of threatened animal species efficiency depends greatly on public knowledge and awareness about particular animals and their needs as well as the willingness of each person to change its habits for the benefit of nature. We cannot conserve otters if we don't preserve their habitats – rivers, streams, lakes and wetlands. Doing this, we are improving the environmental conditions also for other animal and plant species and, nevertheless, also for ourselves.

In Goričko, otters are living in majority of all running and standing waters, even in surprisingly small brooks. The photo materials from photo traps evidently show, that the main migration corridor where otters are constantly present are streams Mačkovski potok and Peskovski potok, the later flowing to stream Krka; along it the corridor is proceeding to Hungary. Photo traps have caught adult otters as well as otter cubs. The most unexpected was a series of photographs with three otter cubs, accompanied with their mother. But not only otters were trapped in our photo traps. Apart from domestic cats and dogs cameras took photos of more than 30 different animal species. Only mice have



“destroyed” 36% of all photos! With photo traps we became aware of an additional big threat for otters: domestic dogs that run freely in the nights threatening wild animals.

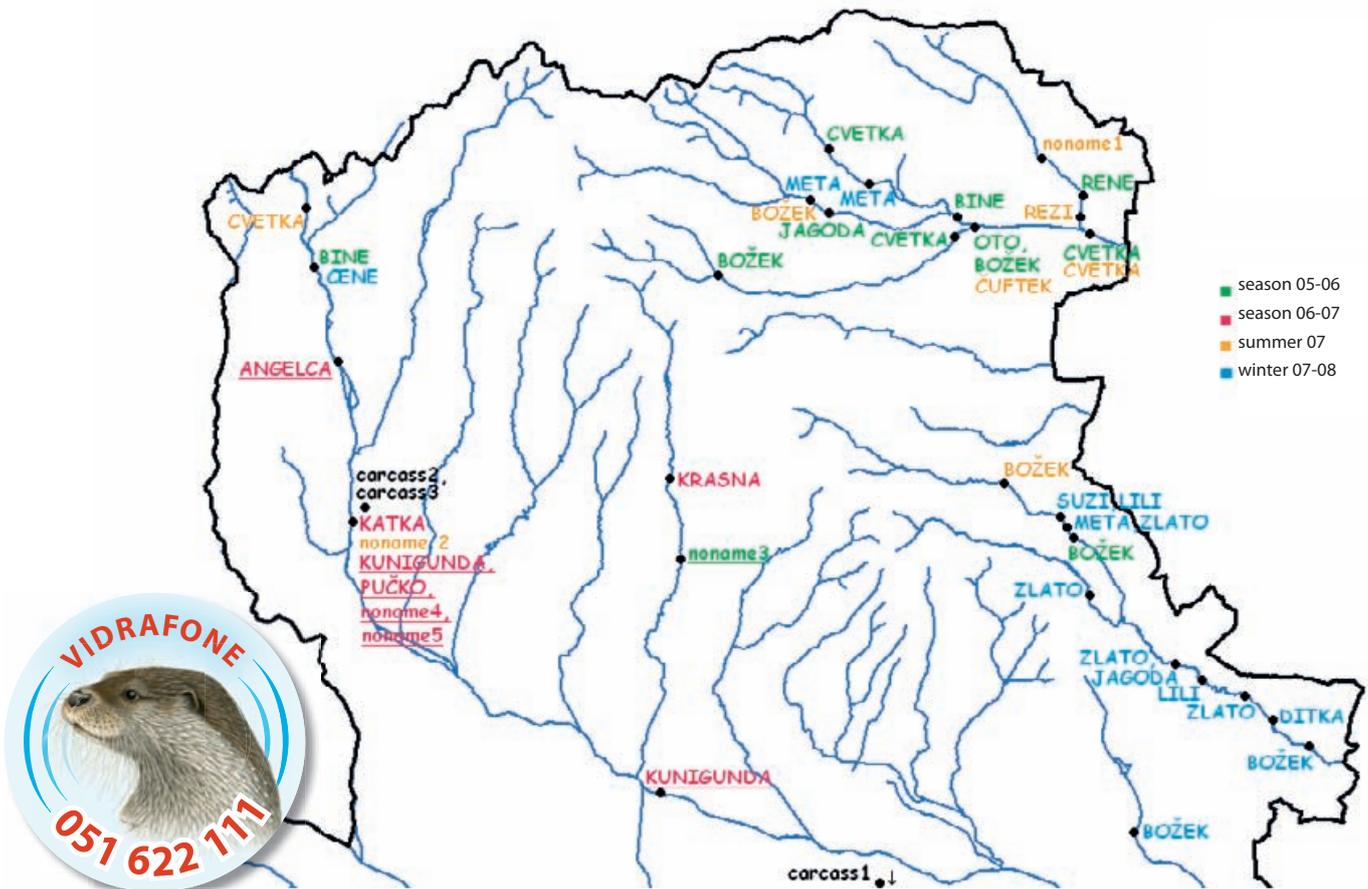
With newly set up traffic signs we will try to reduce the number of road accidents with otters crossing roads. In case that accident still happens, we have established a special telephone number “VIDRAFONE”.

The DNA analysis of otter spraints gave us interesting data on otter population, in spite of the problems in the lab with sep-



Newly constructed shelf under the bridge was immediately accepted and marked by the otters.

aration of otter DNA from DNA of otter's pray animals. Even if we cannot be fully certain that the animal on photo is Božek or Krasna or maybe another otter which DNA we have isolated, we came rather near to that. We know that for last three years, at least 30 different individuals lived on Goričko area. Among them,



Geographic distribution of genotypes of otters we have followed in the course of project LIFE



We have fenced the pond with electric fence.

18 were females and 16 were males. In most cases (9 times) the isolated DNA was from a male otter we named Božek. He is undoubtedly the dominant male in the area. We are sure, otters from Goričko are also communicating across state borders, especially to Hungary. Cross border streams are therefore important corridor for otters migrating to Goričko area from bigger rivers as Mura and Ledava. We also know there is still a lot of things that we don't know. To know otters on Goričko and in Slovenia better, much more research work is needed.

Investigation of otter population contributed also to better knowledge about other animal species, particularly those of otter's menu. According to spraint analysis the otter adores crayfish so we have dedicated special attention to the inventory work for crayfish in the whole Goričko area. In the wooden traps only one species of crayfish *Astacus astacus* was found; it is widespread in all brooks in Goričko with the exception of a few of very bad quality. It is obvious that after massive mortality due to epidemic fungal disease some decades ago, the population of autochthonous crayfish is recovered again. No non-native species of crayfish were found in brooks of Goričko so far.

When establishing ecoremediations on streams we have taken nature as a model and we have learned out of it. From wicker works that we have applied for strengthening stream banks, young willows are already growing: on stream banks, alder trees took roots, young fishes colonized stream pools, ponds are full of toads, fire-bellied toads, frogs and different species of dragonflies flying over restored stream sections. The newly constructed shelves under the bridges were immediately marked by otters.



European Otter Workshop - along the river Mura

What is the most important is know-how that workers from Municipality Gornji Petrovci have gathered from restoration works carried out in the streams, using natural techniques. They shared their knowledge with other public workers all over the area of Landscape Park Goričko. At the end of the project they are enthusiastic about new challenges and missions. Also, their attitude toward lakes and stream in their neighborhood has changed significantly.

Foraging for food resources in the project area, otters have also discovered new ponds stocked with fish, the fact that owners were not very happy about. In agreement with two fishpond owners in Križevci, we have set up electric fences that keep two ponds safe from not invited guest. The biggest pond remained unprotected, so otters can still find enough food. The ponds are located in the vicinity of the biggest and very famous chestnut tree in Slovenija, growing on the top of the hill Tetajni breg in Križevci, so all visitors and tourists interested in pond protection have the opportunity to look at the ponds. For the fishpond owners, the publication "Otter in the pond" edited in the frame of LIFE project could be a helpful instrument for fishponds protection, too.

In the end of the project, we have compared results of different monitoring methods, used in the duration of project. On the basis of the results, quite entangled task has to be resolved: a proposal of common expert guidelines for otter population management in Natura 2000 site Goričko taking into account trilateral Landscape Park Örség – Raab – Goričko connecting Slovenian, Austrian and Hungarian protected areas. It is important that permeability of water corridors connecting all three countries is assured.



Warning traffic sign for the otter on the road



The exhibition Otter, the Queen of Waters was first opened in the castle Grad in Goričko.

5 What has changed forever

The project was closed by a festive opening of the centre AQUALUTRA where the Municipality Gornji Petrovci was pronounced an otter friendly municipality. Otter centre with its informative, educational and public awareness raising activities will present project results to different target groups using modern communication tools for interpretation of nature; it's aim is also to apply scientific cognitions to everyday life.

Although the soil in hilly Goričko area is not very fertile farming is still the main activity of local inhabitants. Ex-



Instead of dumping black-spot by the Sport centre Križevci...

tensive cultivation of land expands in broader valleys while slopes are covered with traditional vineyards and orchards. In central and eastern parts of Goričko emigration of population is still an everyday occurrence; the consequences Goričko is suffering are more and more abandoned rural estates and tillable land overgrown by forests. Young, educated people are moving away leaving elderly peasants alone to till the land. Abandoned traditional farms are nowadays becoming interesting for the real estate market and eventually are sold to foreigners as a vacation houses. Only few new working opportunities for local people arise this way and hardly anyone find the develop-



From a pile of Scots Pine timber of local origin...

ment of Goričko as a promising opportunity for nature conservation and sustainable tourism.



LIFE-NATURA project for conservation of Eurasian otter has already offered an employment opportunity to two biologists from eastern Slovenian region thus solving at least these problems of unemployment. AQUALUTRA centre raised during the project will need at least one more employee. If the potentials of the centre will be successfully developed and an appropriate market niche in the area of education, public awareness raising and development of sustainable tourism found, more will be needed.

AQUALUTRA project did not change only the otter conservation. It also brings new developmental opportunities for an economically the most undernourished region of Slov-



...there is now a wetland habitat with frogs and fire-bellied toads enjoying new life.

enia that prides itself upon its numerous natural resources. In collaboration with potential local alimentary and lodging capacity (tourist farms and smaller guest houses) we will try to expand tourist capacities inside the frames of sustainable tourism and keep visitors in Goričko as long as possible. New plans will require new working power of different profiles, from nature scientists and highly educated tourist workers to different self-employment programmes at tourist farms and managers of manufacturing traditional local products under a trademark »AQUALUTRA - produced in otter-land«. A business plan is already prepared; only collective will is needed to realize seemingly unachievable desires.



...to the wooden otter centre AQUALUTRA in the village Križevci

6 Contribution to nature conservation and Natura 2000 network

The project was aimed to improve expert and common knowledge about otter population on Goričko, its distribution and cross-border connections. We also have learned a great deal about threats to otters. Apart from concrete conservation objectives in the Natura 2000 site Goričko, the main mission of the project was information and public awareness rising. It has been accomplished through different publications, articles, meetings, workshops and promotion materials. Based on results of water quality, otter habitat and other environmental factors we have chosen one critical section of a water stream per every partner Municipality on Goričko which was restored using modern co-natural methods. Renaturation of the stream in the middle of the village is not only a contribution to improvement of otter habitat; it is very important for awareness rising of local inhabitants as well as visitors of Landscape Park Goričko. This is why we have selected the parts of streams that are visible and easy to access. We have also prepared a special workshop for the team of local workers in every Community.

According to human dimension public research (Secondary Scholl of Economy in Murska Sobota, 2006), the otter is the most recognizable species from Natura 2000 list of all species in Prekmurje. The results of human dimension public research carried out in this LIFE project are very similar. As an umbrella species in freshwater ecosystems and a message carrier of a care for clean waters, the otter is linked to two most important European nature and environment documents: Habitats Directive (of conservation of species and their habitats) and Water Framework Directive (of achieving a good condition of all waters till the year 2015).

The most prominent result of LIFE project, Otter Visiting Centre AQUALUTRA will bear the project mission to the future and will carry on with actions conceived in the project time. The groups of visitors will be accepted on further notice, lectures will be organized, guidance for the educational path will be available and also otter watching in nature will be possible. Centre activities fall well with aims of Goričko Landscape Park as well as with aims of na-

ture conservation. The Centre will also be available to primary and secondary schools as well as faculties for implementation of a "nature day", expert excursion or field practice, respectively.

For building the Centre we have used only natural materials, least harmful to environment and nature and with best isolative properties (wood, straw, clay). Because of that centre will, next to its research, educative and awareness rising mission, also demonstrate sustainable use of energy and reasonable use of water (rainwater for sanitary water, constructed wetland for purification of waste waters). Organised groups of visitors will thus get a lesson of sustainable use of natural resources and responsible attitude to nature from which we all depend.

Also the authorities in national ministries, managers of watersheds and other competent agencies will get important information. Namely, the research of otter population in Goričko is confirming the forecasts that otters are communicating along the watercourses which are running to the river Ledava. Once,



Crayfish remains in the otter spraint



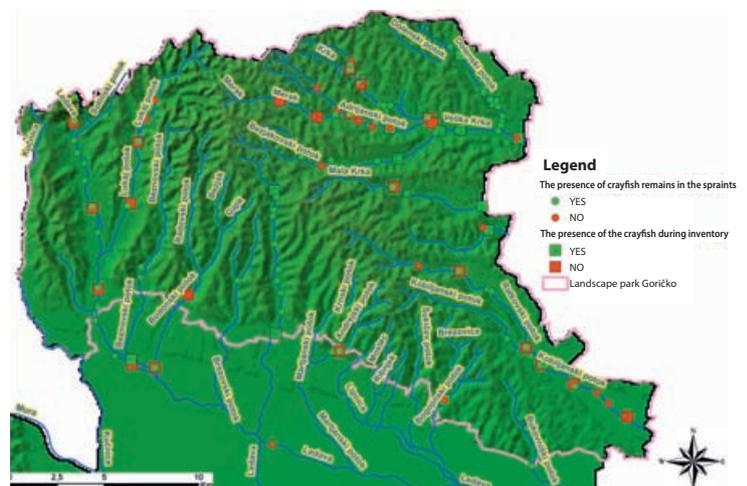
*Crayfish (*Astacus astacus*) were caught and measured.*

Ledava was a typical green lowland river meandering slowly through the plain of Prekmurje. Today, Ledava is only a narrow channel in which modest remains of former rich biodiversity are merely vegetating. The consequences of false interventions in the past will be difficult to handle, but this is what we have to do in the future. The endangered species protected by law must no longer suffer bad quality of their habitats.

Foundation AQUALUTRA, currently in process of establishment, with project partners and partners from local economy will take care for financial and organisational support of centre. Business plan for the Foundation was made by a group of students from Faculty of Economics, Ljubljana.



Participants of EOW-08 in the dam of Lake Ledava



The presence of crayfish in the sprints and in nature

7 The message of the Water Sprite

Estimating it from the evolutionary point of view otter is exceedingly successful animal species. It has survived thousands years of massacre and has confronted different hunting inventions. Despite conviction prevailing in the beginnings of European natural conservation efforts, that otter doesn't survive in regulated and degraded streams, it proved much more adaptable. But the role of top predator in cohabitation with human civilization brings new threats to the otter: waters polluted with different toxic, not degradable, carcinogen and other harmful substances that are accumulating up the food chain. Usual-



The otter - a carnivore or a water sprite?

ly, otter makes last link in that chain. Harmful substances concentrated in otter's inner organs can cause permanent changes, poisonings, infertility... From top predator to man is not very far.

In Europe, otter populations are recovering. Monitoring of populations in different countries is proving that otter is colonizing its historical habitats faster than we have expected, of course

under condition we improve its living conditions in aquatic habitats. It is returning with attractive visage of charismatic European species telling us the story about preserved rivers, about pure brooks where healthy fish, frogs, crayfish, shells and dragonflies are living. This is a story about European ecological network Natura 2000, which we have established trying to trade in indulgences for the past sins; the story about "good status" for all of Europe's surface waters and groundwater that we already have wasted. We are obliged, according to WFD, to restore good water status till 2015. Will we finally decide to listen to the message of the Water Sprite?



The workshops with the youngest participants in the forest and by the lake



WHO WAS WHO IN THE PROJECT LIFE AQUALUTRA

Reminiscence of European Otter Workshop 2008

Layman's Report

Conservation of Otter Population (*Lutra lutra*) in Goričko - Phase 1
LIFE04NAT/SI/000234 AQUALUTRA

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Oddelek za zootehniko



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