



CROSS-BORDER PROJECT ON RIVER RESTORATION BETWEEN SLOVAKIA AND HUNGARY

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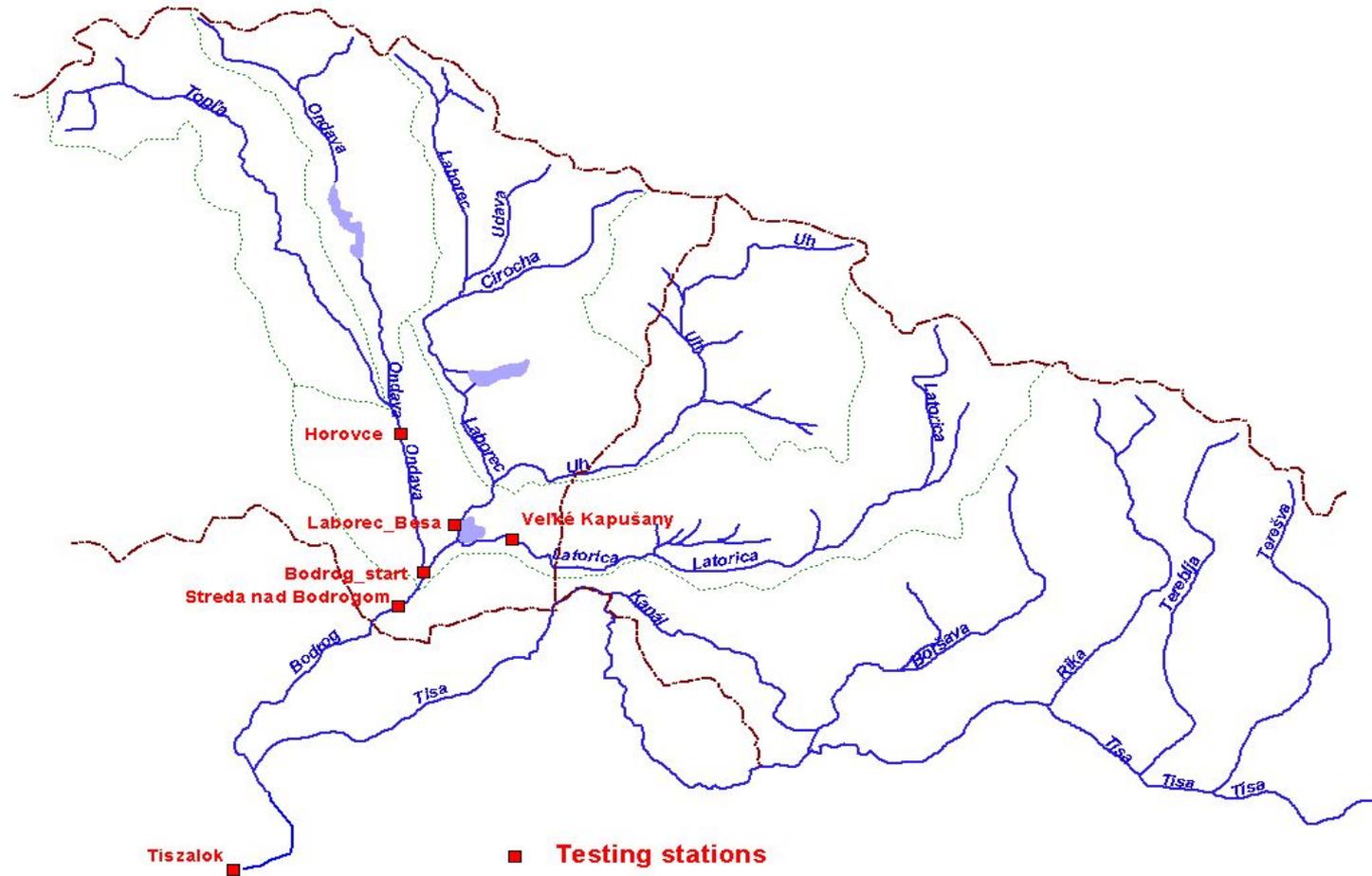
Presented project was elaborated in frame of the INTERREG IIIA Initiative between the Hungary and Slovakia

The main reason for the project proposal was that in this region five flowing rivers were “alive” in this region fifty years ago. Except of two rivers Latorica, Bodrog and Tisa rivers there were another two rivers – Tice and Krčava - which were due to construction of flood protection and drainage measures in the years 1946-64 more or less dried out.

Partners of the INTERREG project from Hungary and Slovakia

- **EKOVIK (North-Hungarian Directorate for Environment Protection and Water Management)**
- **STUBA (Slovak University of Technology in Bratislava, FCE)**
- **Slovak Bodrog River Directorate in Eastern Slovakia**
- **IH SAS (Institute of Hydrology, Slovak Academy of Sciences)**
- **ICP SAH (Institute of Chemistry and Pedology, Hungarian Academy of Sciences)**
- **Bokartisz (Hungarian NGO on protection of Bodrog and Tisza rivers)**
- **Water Research Institute in Bratislava**

The Bodrog River Basin



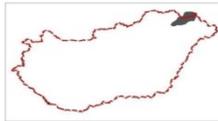
The Medzibodrožie Region (1783)

Manažment krajiny Medzibodrožia na základe I. Vojenského mapovania (1783/4)

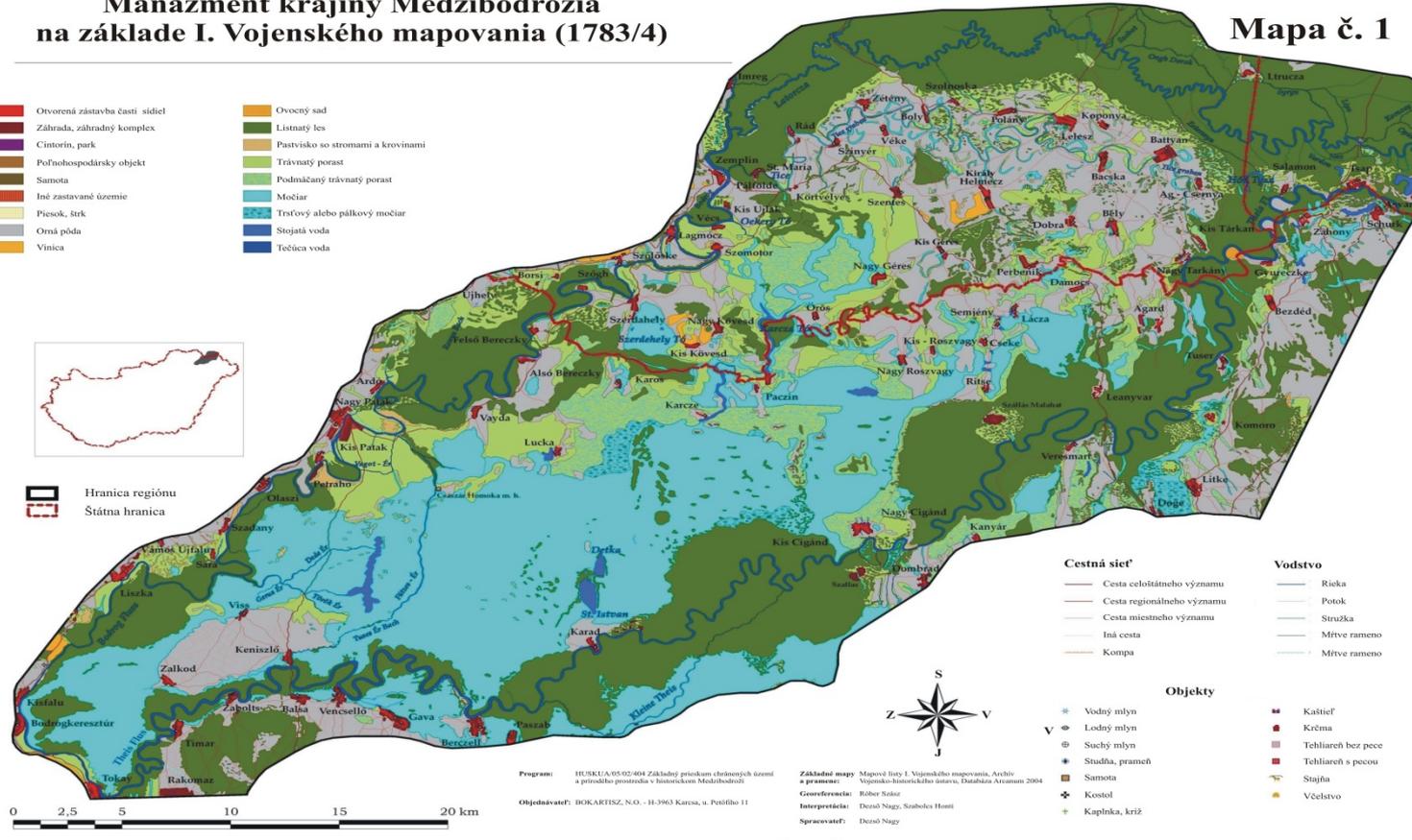
Mapa č. 1

- Otvorená zástavba časti sídiel
- Záhrada, záhradný komplex
- Cintorín, park
- Poľnohospodársky objekt
- Samota
- Iné zastavané územie
- Piesok, štrk
- Orná pôda
- Vinica

- Ovocný sad
- Listnatý les
- Pastvisko so stromami a krovinnami
- Trávnatý porast
- Podmlčnaný trávnatý porast
- Močiar
- Tršňový alebo palkový močiar
- Stojatá voda
- Tečúca voda



- Hranica regiónu
- Štátna hranica



- Cestná sieť**
- Cesta celotátného významu
 - Cesta regionálneho významu
 - Cesta miestneho významu
 - Karad
 - Iná cesta
 - Kompa

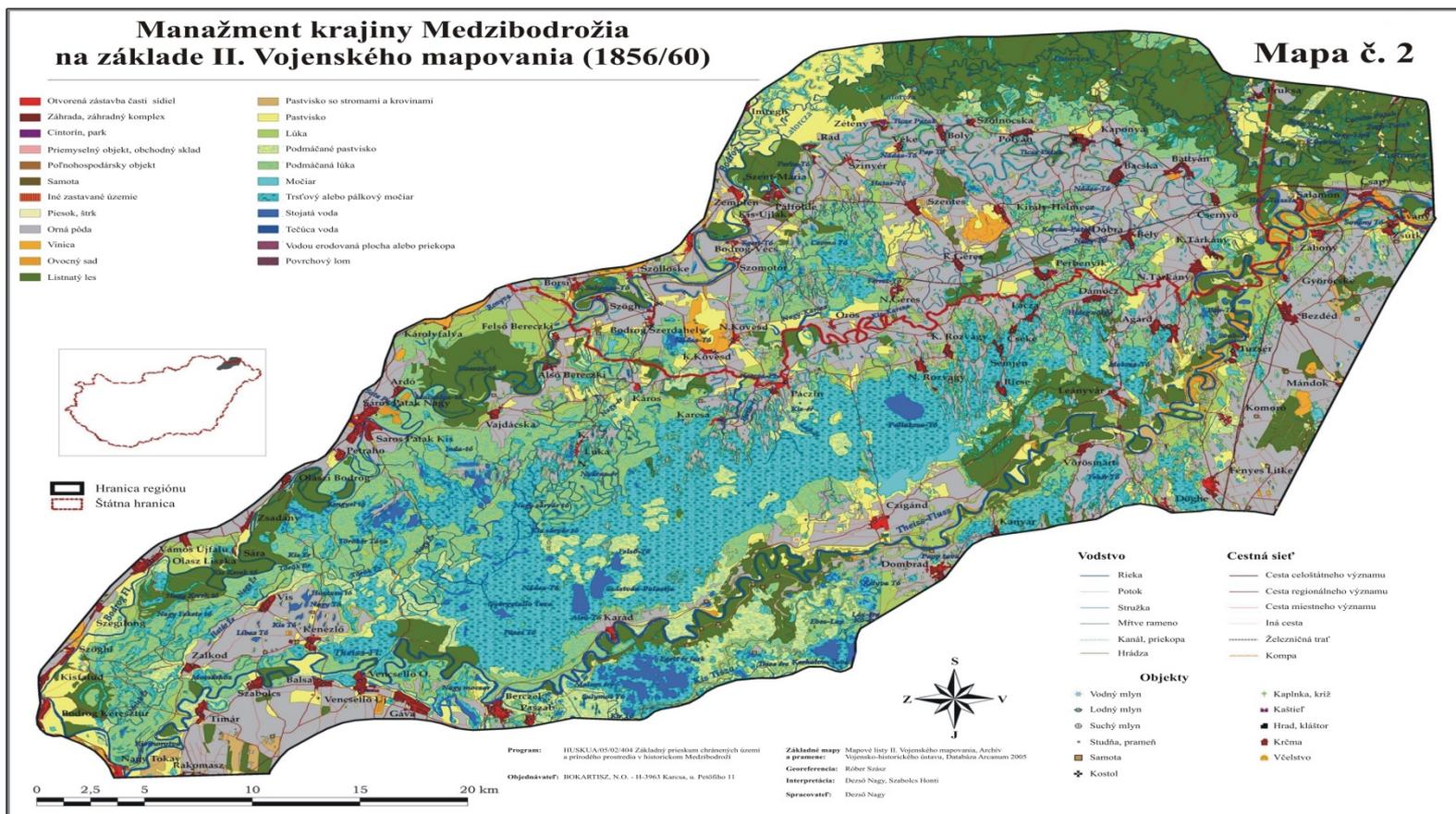
- Vodstvo**
- Rieka
 - Potok
 - Stružka
 - Mŕtve rameno
 - Mŕtve rameno

- Objekty**
- * Vodný mlyn
 - * Lodný mlyn
 - * Suchý mlyn
 - * Studňa, prameň
 - * Samota
 - * Kostol
 - + Kaplnka, križ
 - Kaštieľ
 - Kréma
 - Tehliaren bez pece
 - Tehliaren s pecou
 - Stojňa
 - * Včelstvo

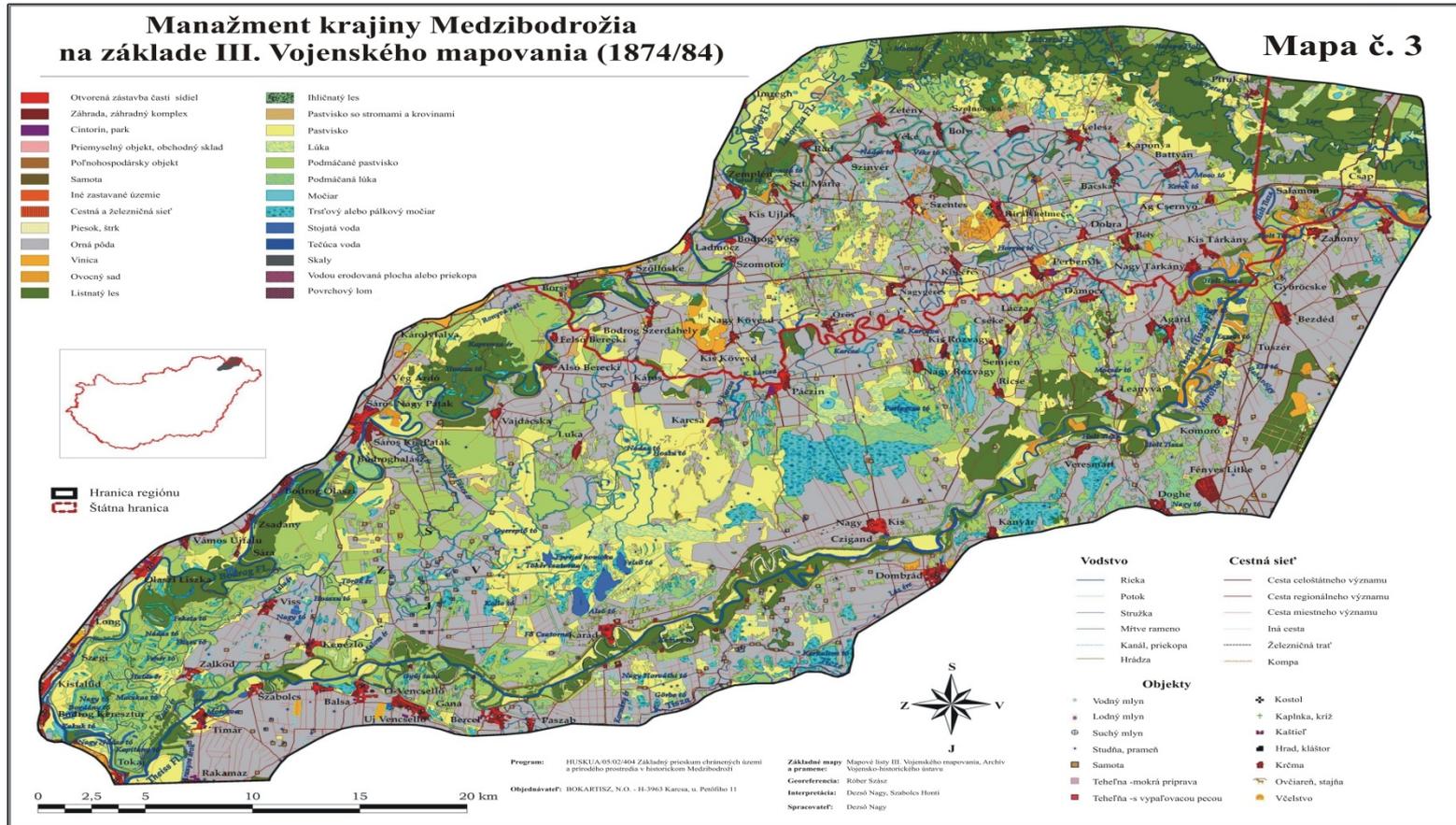
Program: HURKUA/05/02/004 Základný prístupom chronologických území a prírodného prostredia v historickom Medzibodroží
 Objednávateľ: BOKARTISZ, N.O. - H-3963 Karcis, u. Petőfiho 11

Základné mapy: Mapový list I. Vojenského mapovania, Archív Vojensko-historického ústavu, Databáza Arcanum 2004
 Geografická: Róbert Székely
 Interpretácia: Dávid Nagy, Szabolcs Horváth
 Spracovanie: Dávid Nagy

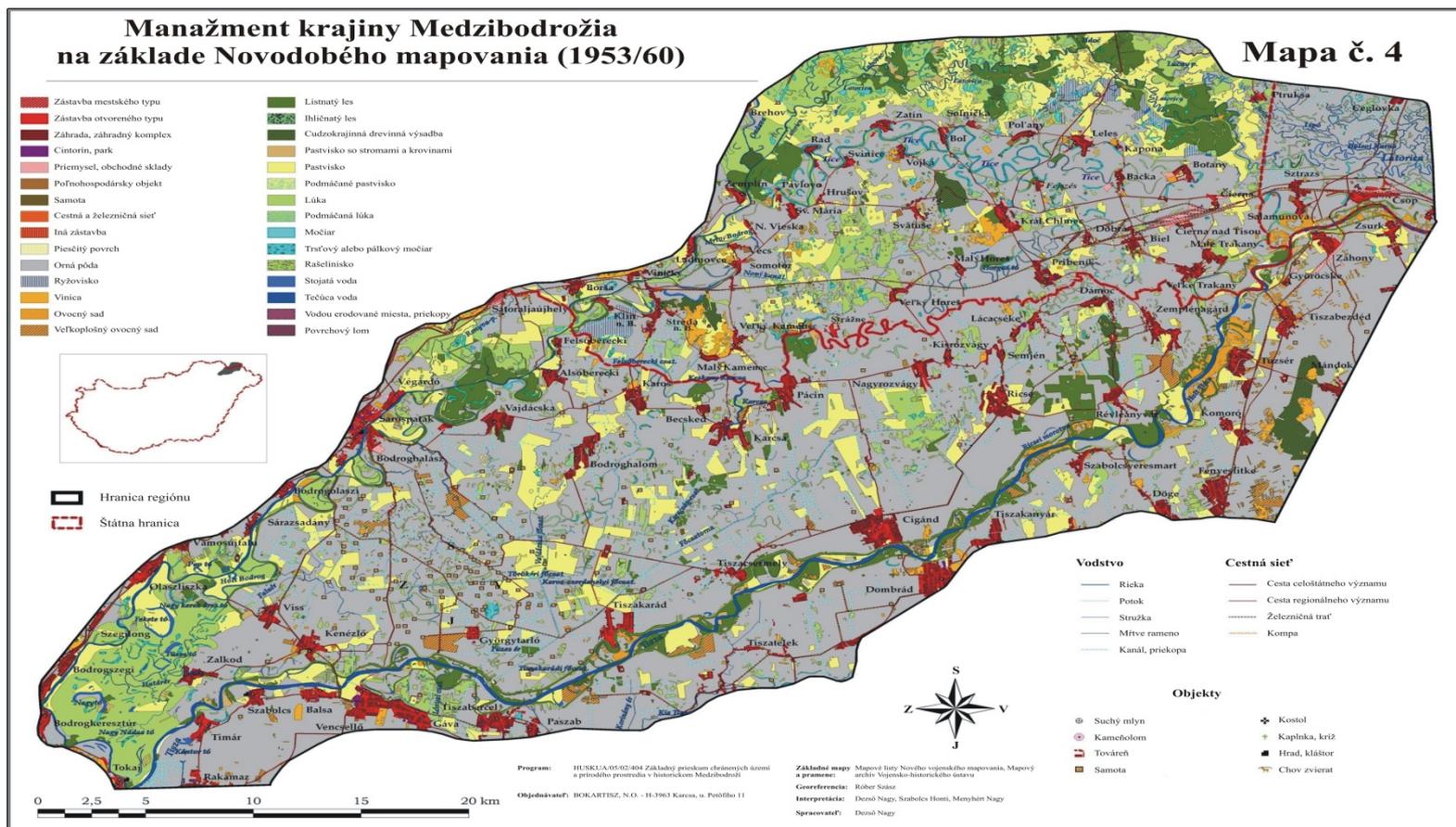
The Medzibodrožie Region (1856)



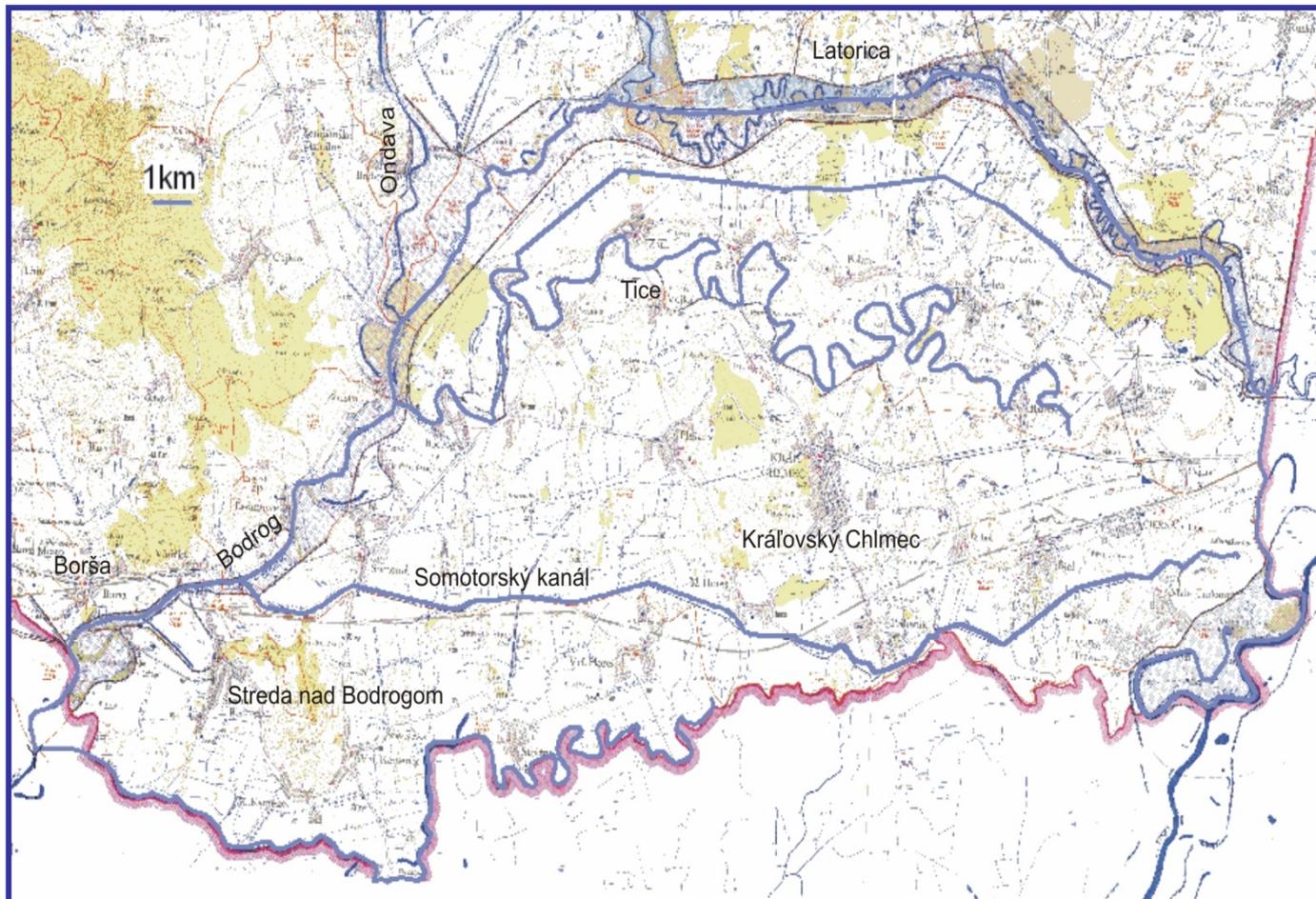
The Medzibodrožie Region (1880)



The Medzibodrožie Region (1953)



Medzibodrozie Region after water management measures (on Slovak side)



The Czechoslovak National Parliament in Prague in 1937 decided financially to support the construction of protection dams in the Medzibodrožie Region

Because of

- ... disaster floods from 1924, 1926, 1932 and 1937**
- ... inhabitants are hungry, living in risky conditions**
- ... inhabitants are suffering from malaria, typhus, disentary**

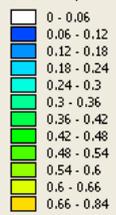
The water management part of the project involved a detailed analysis of hydrological conditions of the whole Medzibodrožie region, hydraulic and morphological conditions of surface flows (last passports have been elaborated almost 40 years ago), hydro-geological conditions of the whole region as well as hydro-pedological conditions of the Medzibodrožie region.

It has to be considered that the “inter-regional” means that the water knows no political or regional restrictions and it is flowing with no respect to state frontiers.

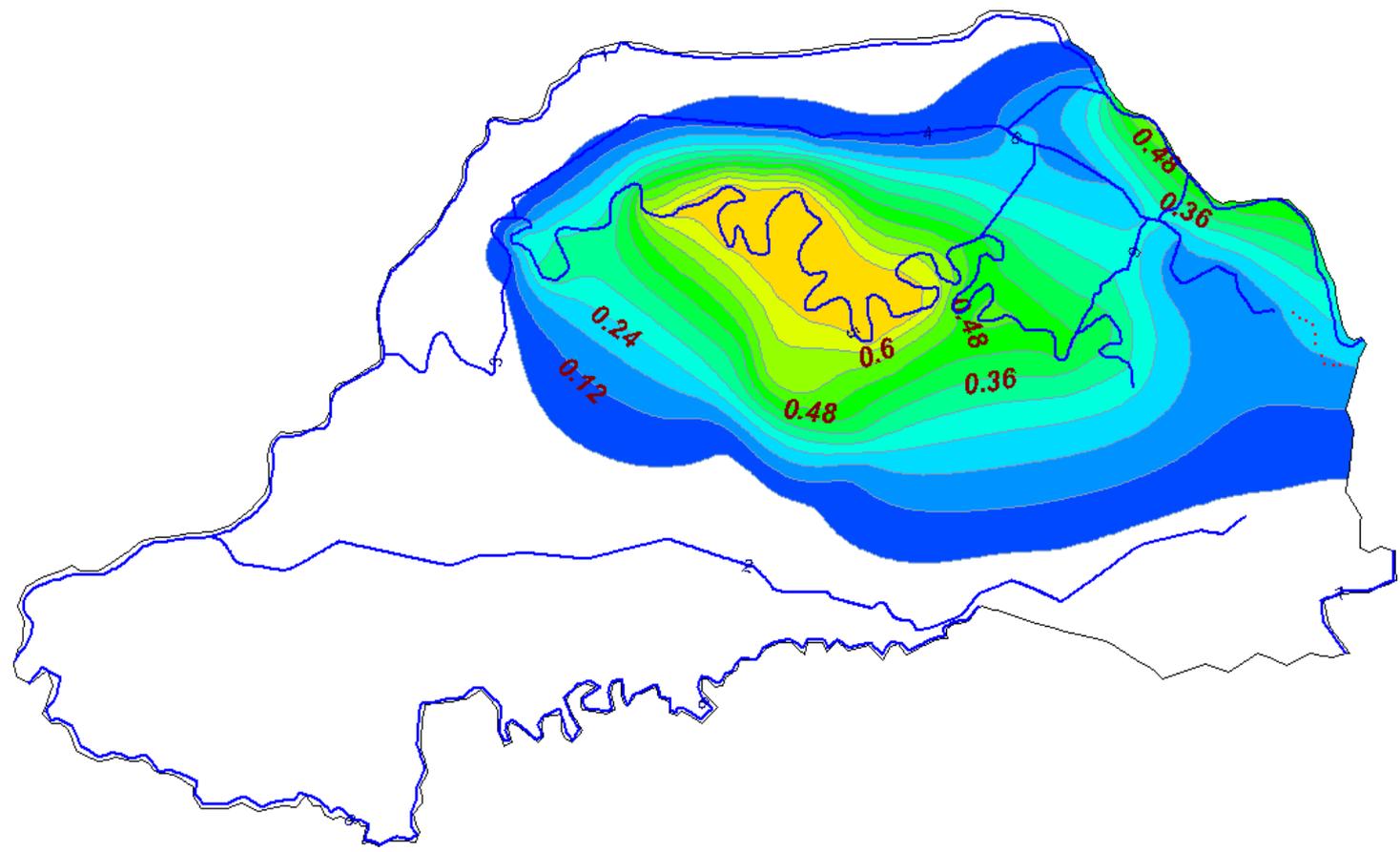
To achieve the goal of the project:

- **Geodetic measurements of the river bed connected with airborne scanning (DTM)**
- **Hydraulic measurements – discharge, water level analysis**
- **Groundwater level regime evaluation**
- **Soil-water regime measurements**
- **Water quality measurements**

Contour map: rPHI1



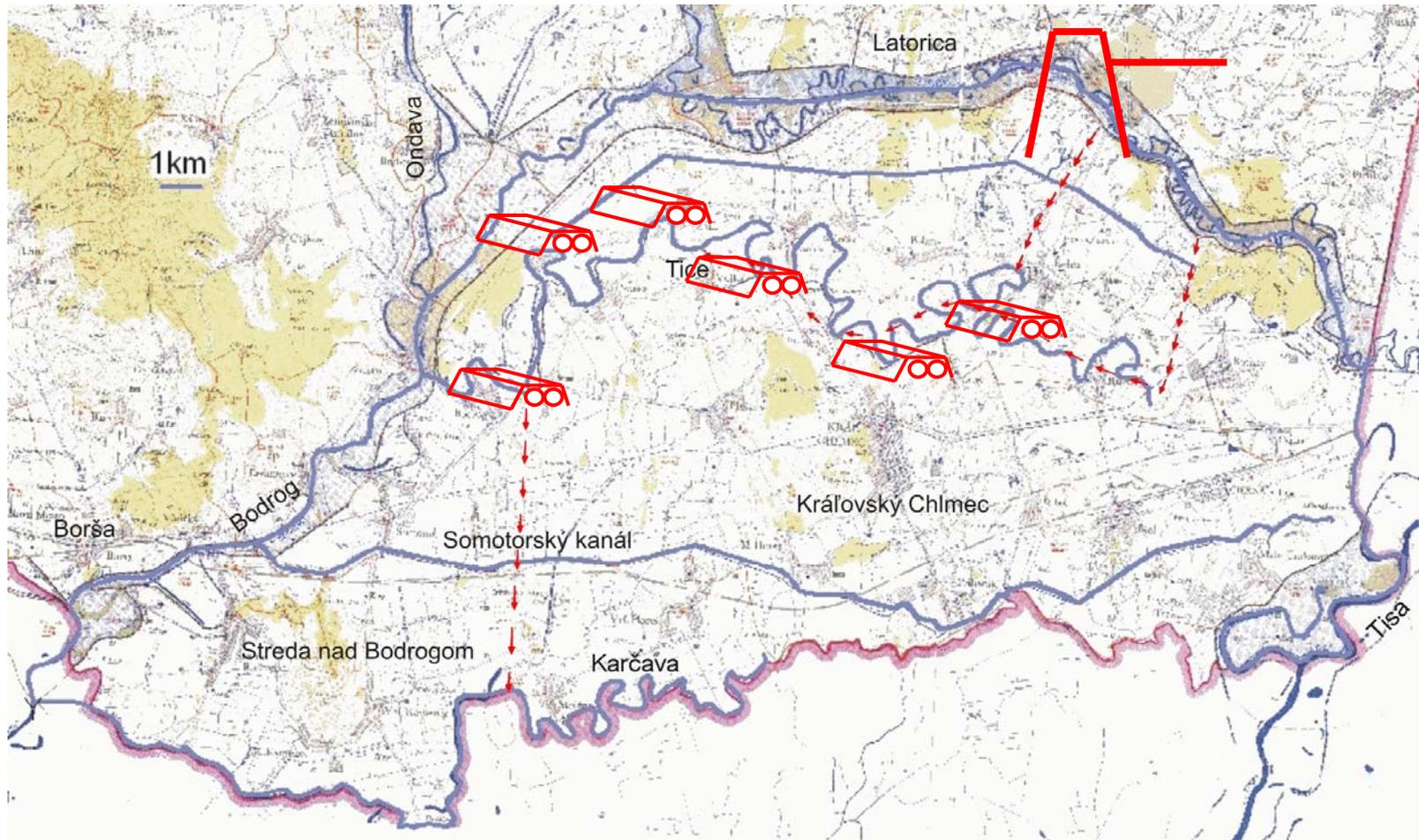
- Boundary
- Sources
- Rivers



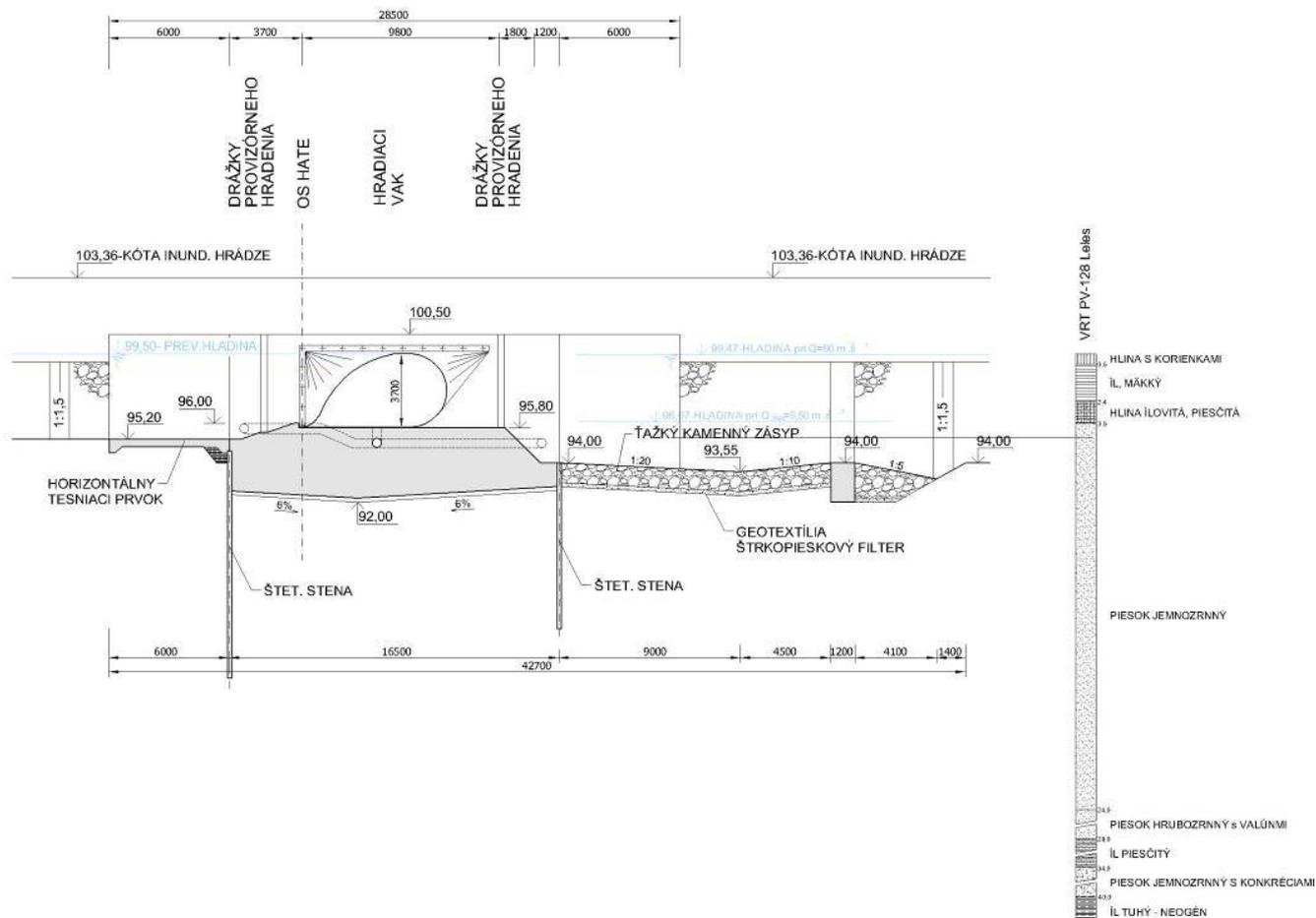
After theoretical background a practical engineering project has to be elaborated using digital terrain model to fulfill

- the Tice River as well as**
- The Krčava River on the border with Hungary**

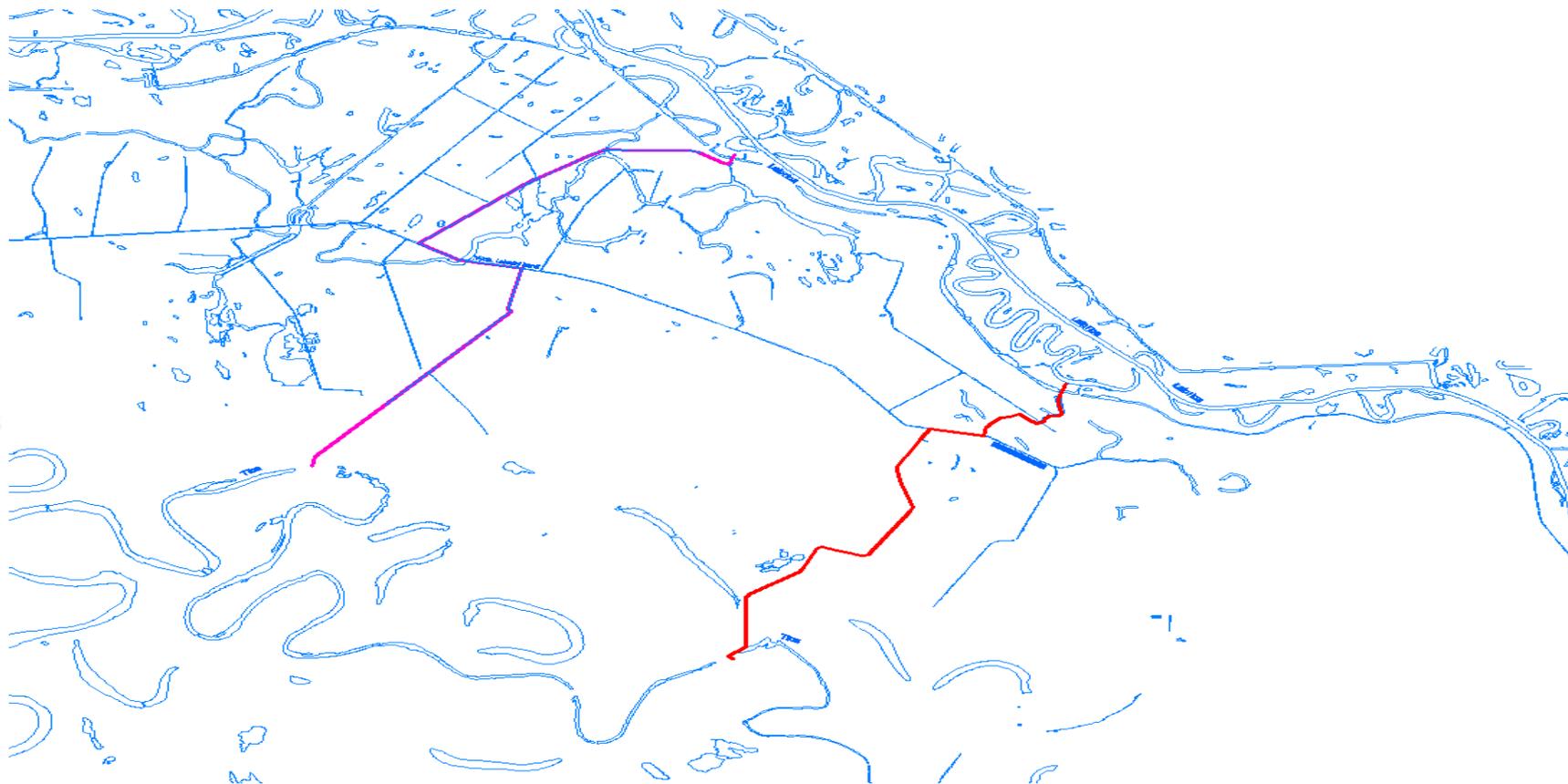
Philosophy of the design



Longitudinal section of the bag weir



Connection between the Latorica River to the Tice River

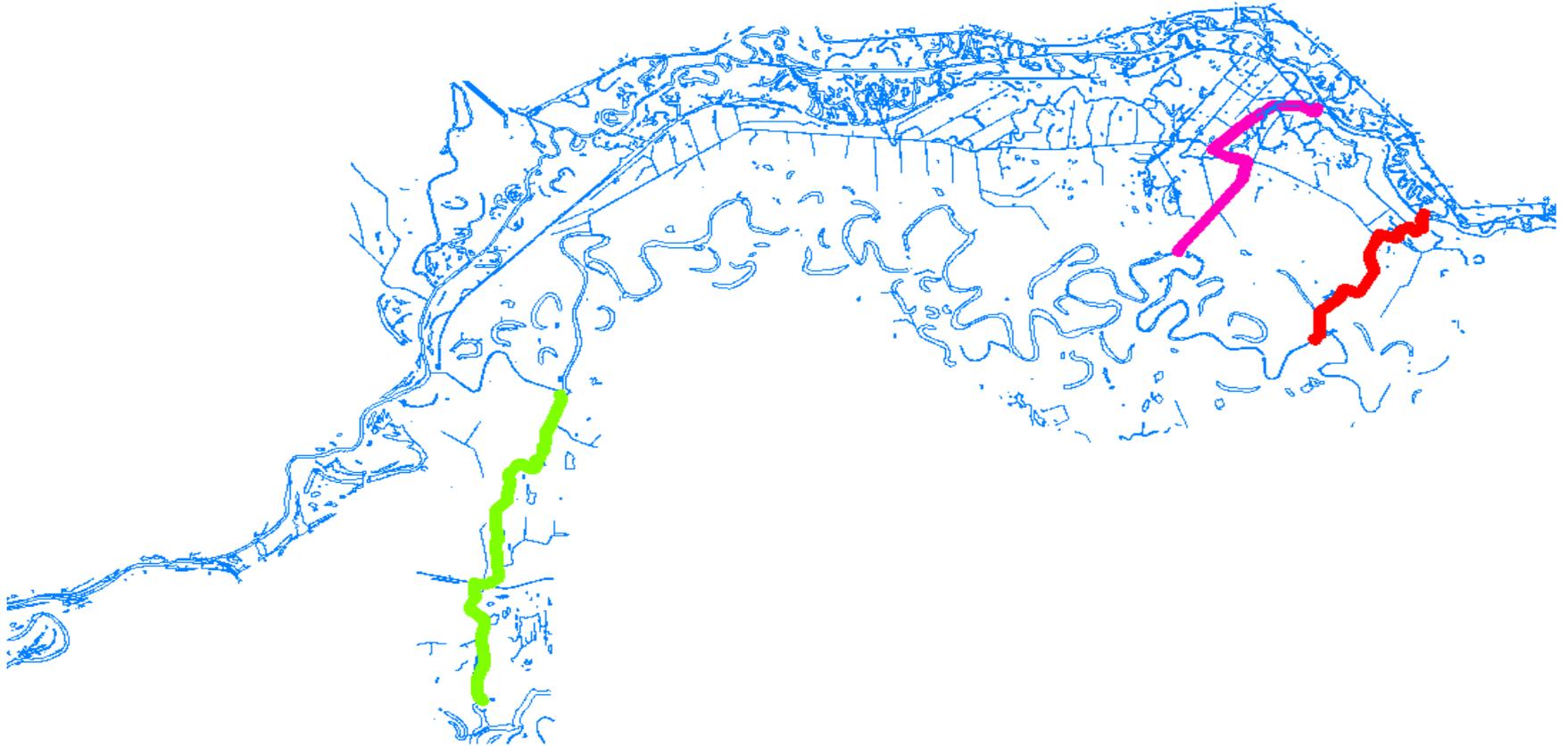


Connection of Tice and Krčava rivers

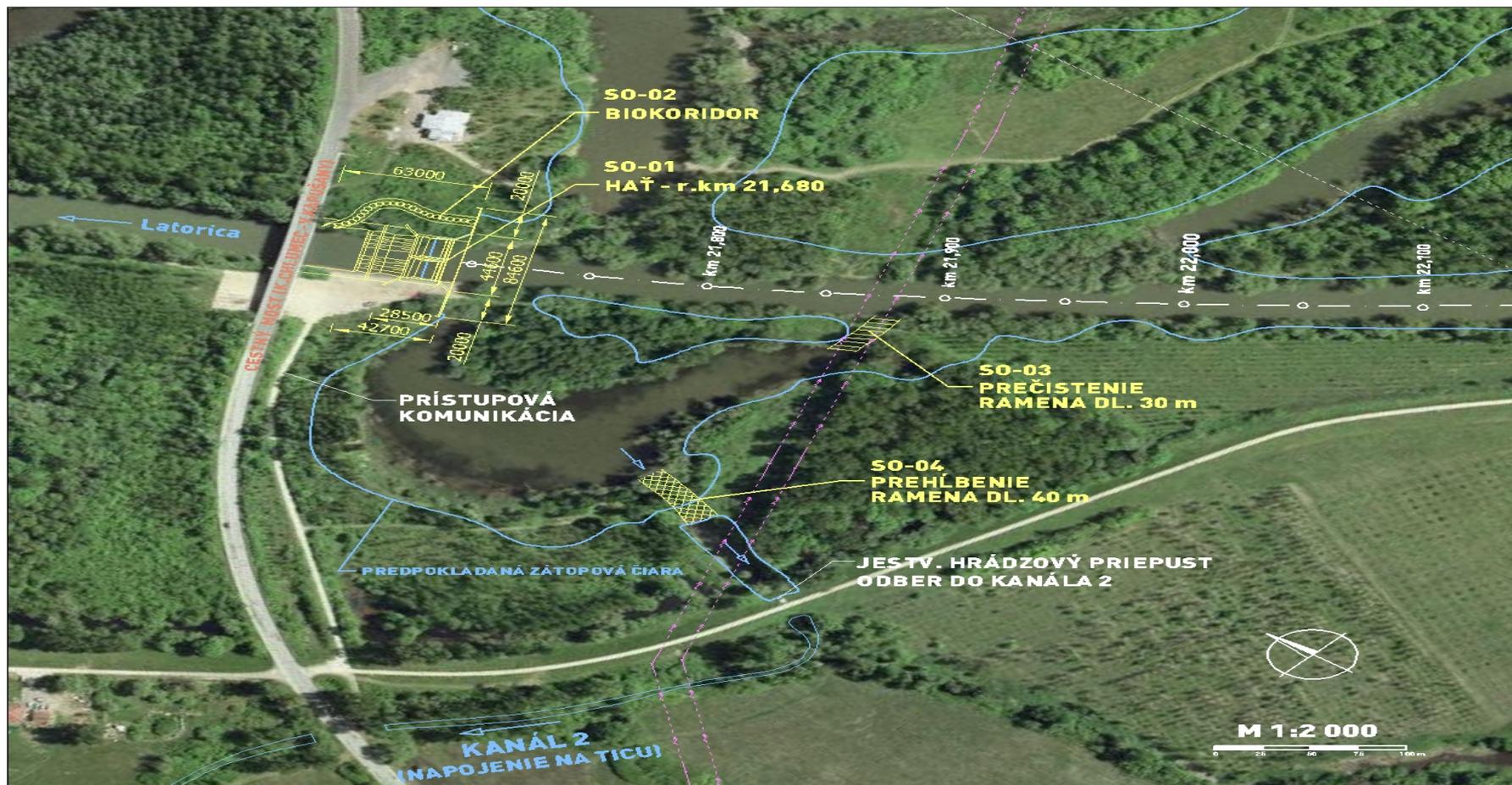


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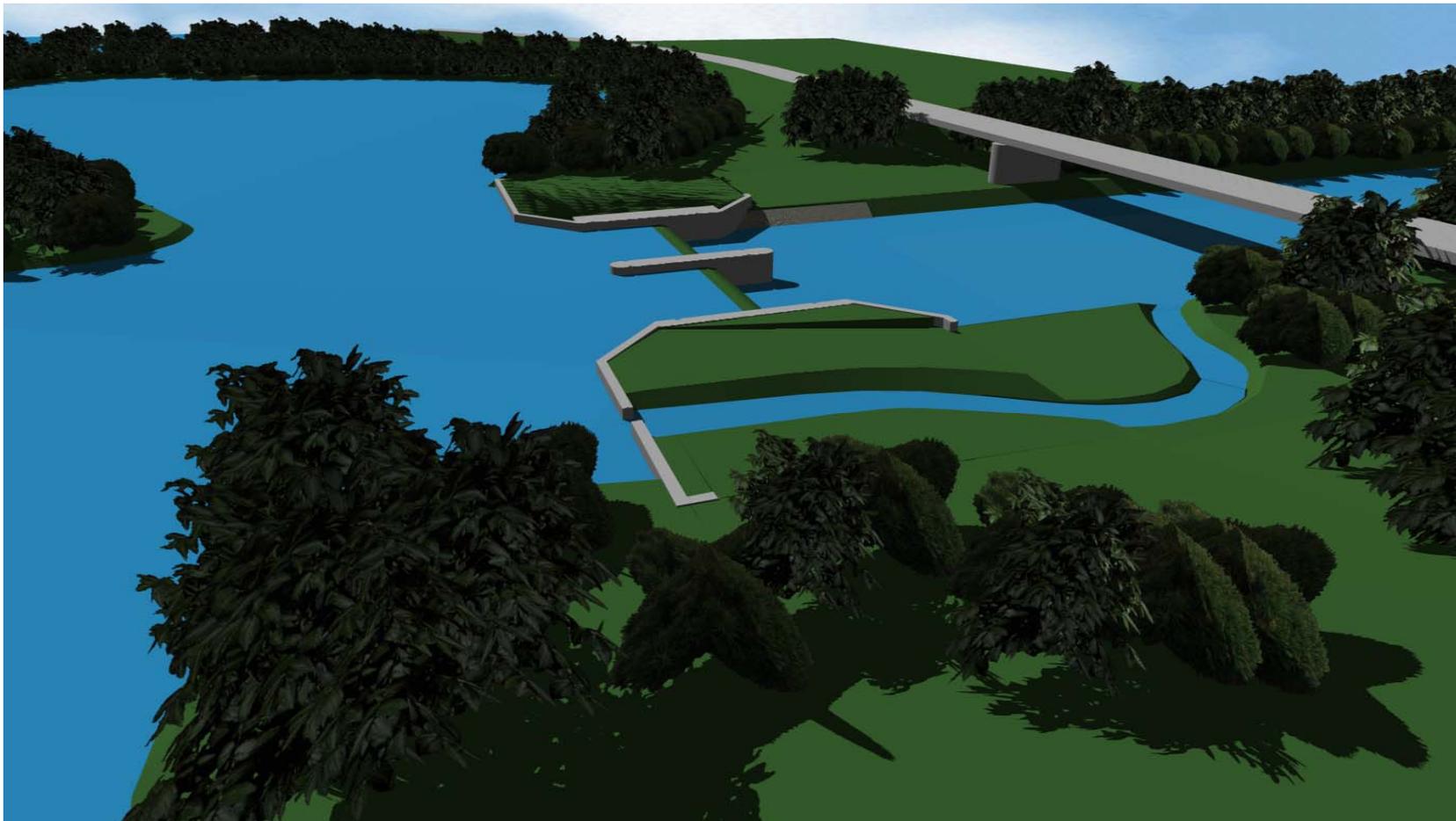
The whole solution in digital form



Situation of the weir location on Latorica River



Visualisation of the weir with a fish-pass



Result of the water management solution

- revitalisation (restoration) 44,4 km of the Tice River
- inflow and accumulation in the region **2 954 000 m³** of water in the Tice River and its branch system
 - 140 000 m³** of water in channels
- creation of water surface in the region **2 805 000 m²** in the Tice River
 - 133 000 m²** in channels
- water supply of approx. 45 mil. m³ of water annually into the Krčava River.

Thank you for your kind attention !!!



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