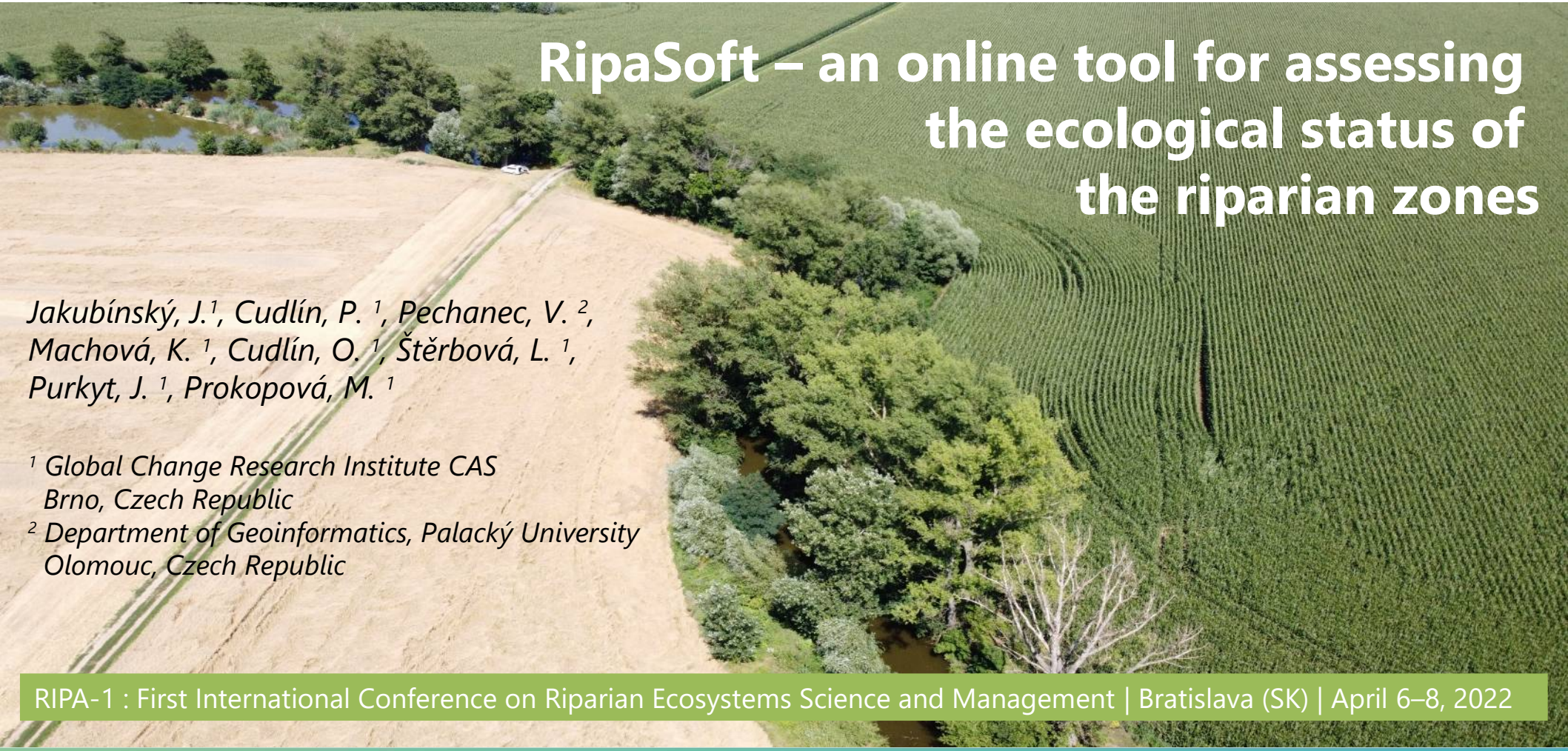

RipaSoft – an online tool for assessing the ecological status of the riparian zones

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Assessment of riparian zones using „Riparian Habitat Quality Index“ (RHQI)

- Complex assessment of the riparian zone (to date it has been experimentally applied to ca 112 km of watercourses in Czechia and 18 km in Bulgaria)
- Based on a comparison of the currently determined riparian zone status and the stated potential natural status where the result represents the difference between the two values
- Evaluation is based on a set of indicators, where each indicator is assigned a certain score (ranging from 0.1 to 1.0)
- Score of each indicator for potential natural conditions was determined by expert estimation and varies depending on the prevailing natural conditions of the site

Assessment of riparian zones using „Riparian Habitat Quality Index“ (RHQI)

- **Phase 1 - field research**
  - filling in the field evaluation form (approx. 5 min) - data source for determining the current state of riparian zone
  - the need to define relatively homogeneous river reaches (riparian zones) in terms of morphological condition of the riverbed, land use within the floodplain
  - field research can be carried out at virtually any time, it is advisable to avoid hydrologically extreme episodes (increased flows, dry riverbed)

- **Phase 2 - automated data evaluation**
  - "RipaSoft" web application
  - determination of the potential natural state of riparian zone in a given locality → calculation of the resulting ecological state of riparian zone

List of indicators used in RHQI methodology

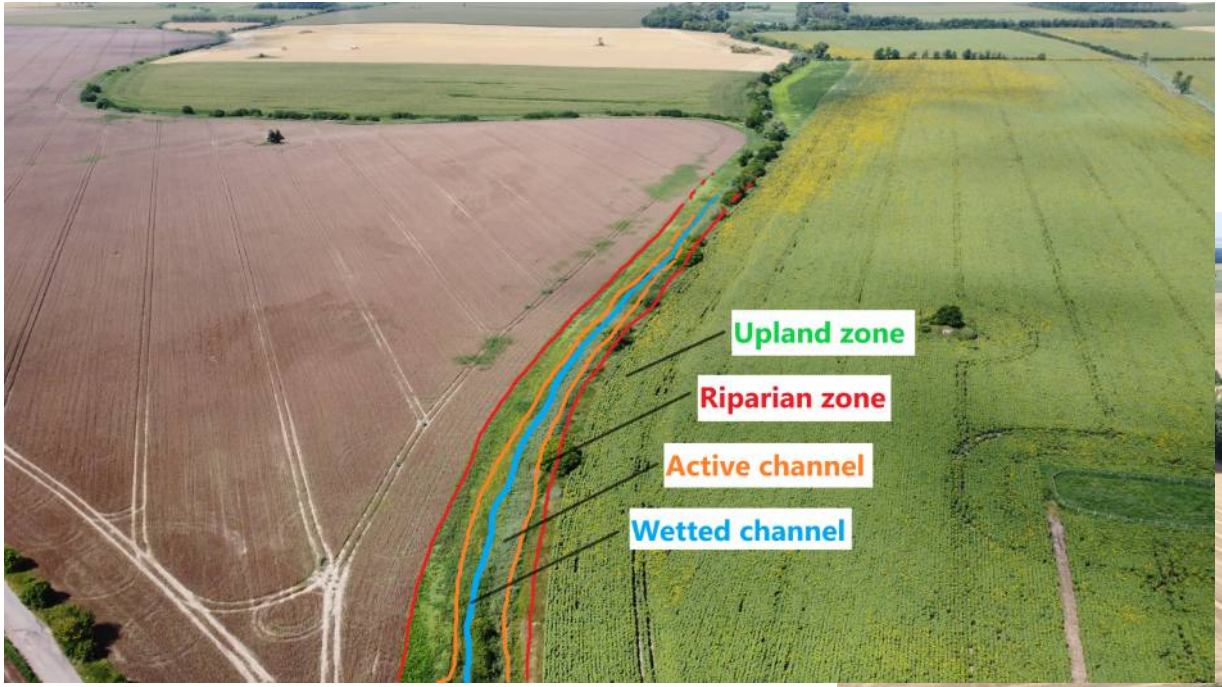
No.	Indicator	Description
1.1	Average slope of the banks	Average slope of both banks in the river/stream reach.
1.2	Average channel incision	Average height difference between the water level (at the approximate mean annual discharge) and the level of the surrounding terrain behind the edge of the riverbed.
1.3	Riverbed and banks permeability	Permeability rate of the riverbed and banks.
1.4	River banks stability	Frequency of occurrence of bank undercutting and its dimensions.
2.1	Frequency of flooding in the inundation area	Estimation of the frequency of river embankment into the inundation areas (based on specific features in the field).
2.2	Potential of flooding in the inundation area	The presence of an area that can be flooded and thus retain a larger amount of flood discharge.
2.3	Flow regulation	The degree of influence of the hydrological regime (due to the presence of a water reservoir, periodic water withdrawals, etc.).
3.1	Average riparian zone width	The ratio of the water level width at the mean annual discharge to the riparian zone width (an average for both banks)
3.2	Riparian zone coverage by woody vegetation	Proportion of the area within the riparian zone, shaded by woody vegetation.
3.3	Vegetation structure in the riparian zone	Dominant type of vegetation (i.e., trees/shrubs/grass undergrowth).
3.4	Connectivity of the riparian zone with a fluvially conditioned ecosystem	Close connection of the riparian zone with floodplain forest, wetland, bog, etc.
3.5	Number of woody plants growing in the riparian zone	Number of trees and shrubs growing in riparian zone in a 100 m long stream/river reach.
3.6	Tree species diversity in the riparian zone	Number of tree species occurring in the evaluated reach of the riparian zone.
3.7	Representation of invasive tree species and selected invasive shrub species	Presence of invasive species of trees and selected shrubs (degree of coverage of the riparian zone by the given species).
3.8	Ecological stability of the land beyond the riparian zone	Ecological stability of the floodplain area in terms of the predominant land cover.
3.9	Prevailing habitat types in the riparian zone and beyond the zone [%]	Habitat types in the riparian zone and floodplain (all habitats and their approximate area are assessed).

Delineation of riparian zones

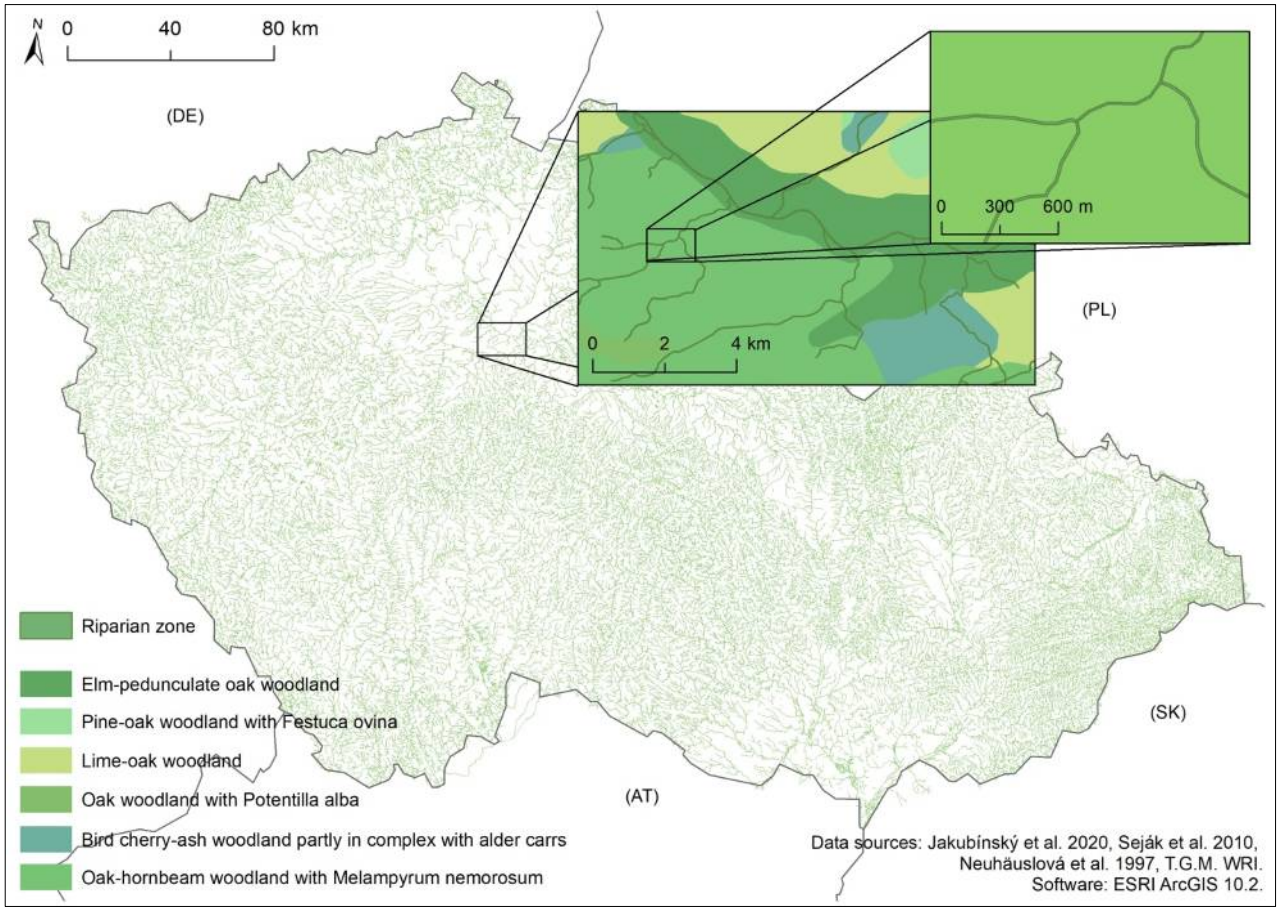
- a sample of 96 watercourses flowing in four different types of landscape in terms of its use (i.e., agricultural, forest-agricultural, forest and urban landscape)
- the extent of the riparian zone was estimated on the basis of vegetation and terrain features

Stream Order	Average Width of Riparian Zone [m] in Most Common Landscape Types				Average Value [m]
	Agricultural	Forest-Agricultural	Forest	Urban	
I.–II.	8.1	5.3	4.8	5.1	5.8
III.–IV.	8.8	5.2	3.1	4.2	5.3
V.–VI.	9.2	10.0	8.9	9.3	9.4
VII.–VIII.	11.4	14.2	14.0	7.4	11.8
Average value	9.4	8.7	7.7	6.5	8.1
Range of values	3.3	9.0	10.9	5.1	6.5

Delineation of riparian zones



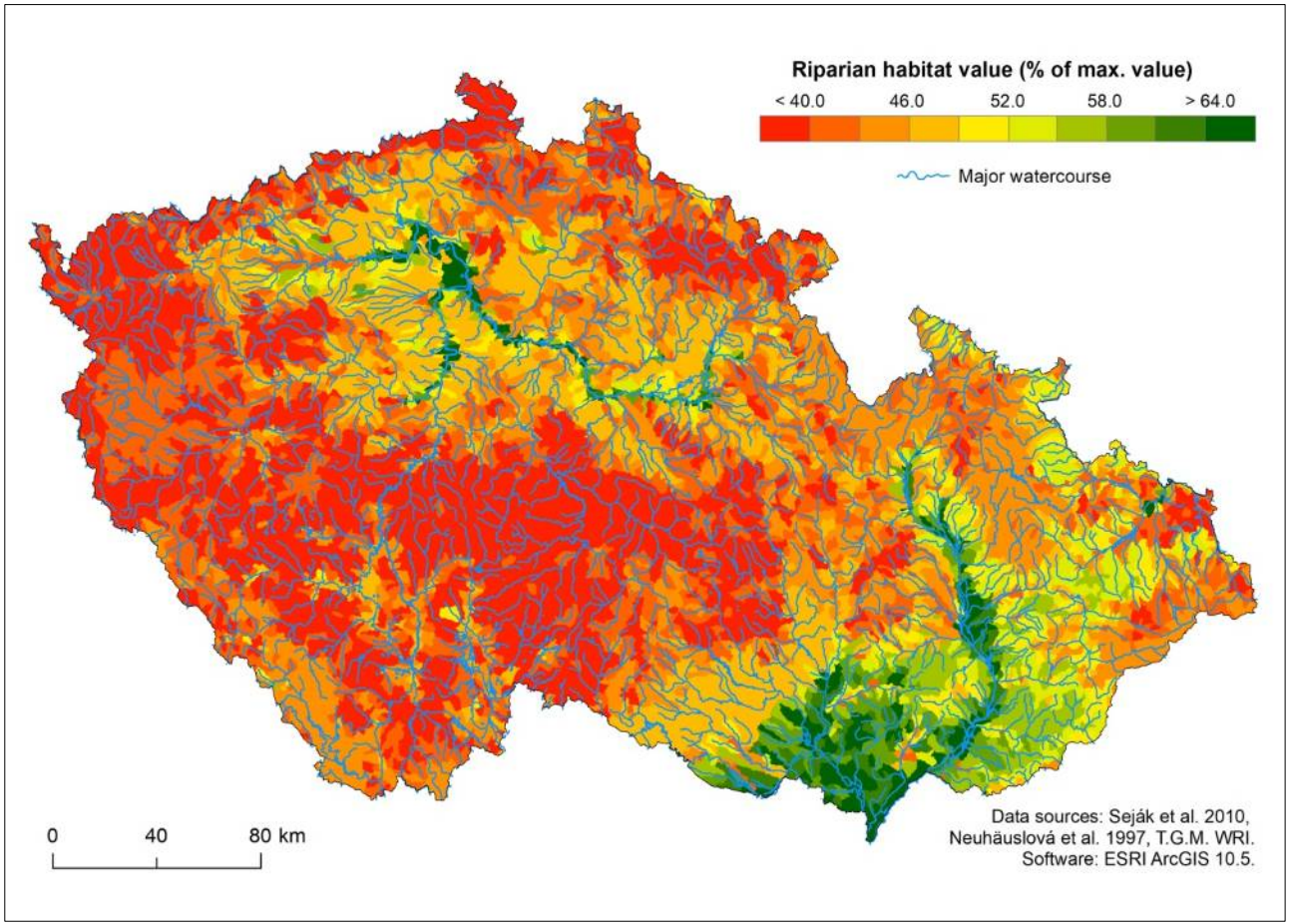
Delineation of riparian zones



Potential natural status (PNS) of riparian zones

- a state that would exist in the relevant natural conditions without anthropogenic influences (→ definition of potential natural vegetation according to Neuhäuslová et al., 1997)
- PNS is determined on the basis of 16 indicators within the RHQI methodology (Jakubínský et al., 2019)
- scoring principle (0.1-1.0)
- for each indicator, the optimal state that would occur in the given natural conditions without anthropogenic influences was expertly determined
- indicator "3.9 Predominant habitat type in the riparian zone and beyond" - based on a map of potential natural vegetation in the Czech Republic (Neuhäuslová et al., 1997) and HVM habitat assessment methodology (Seják et al., 2003; Seják et al., 2010)
- PNS = sum of values of all input indicators

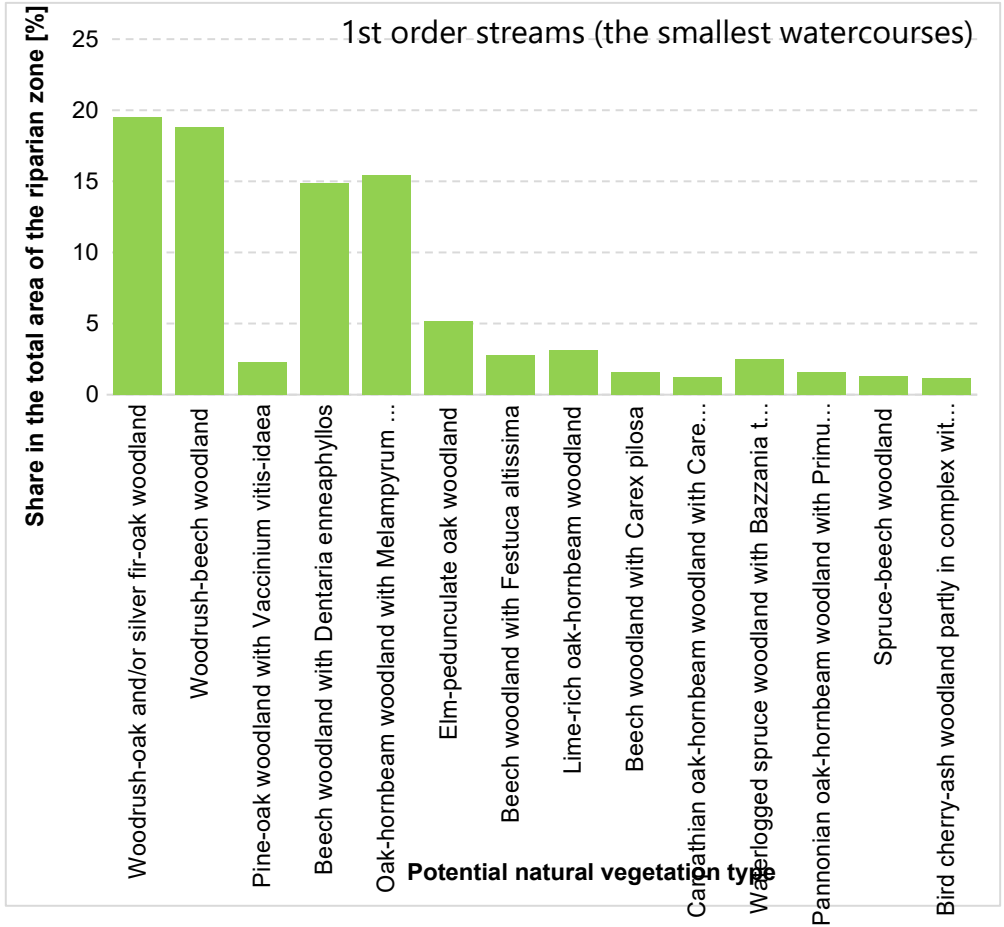
Ecological value of habitats in riparian zone according to the HVM methodology

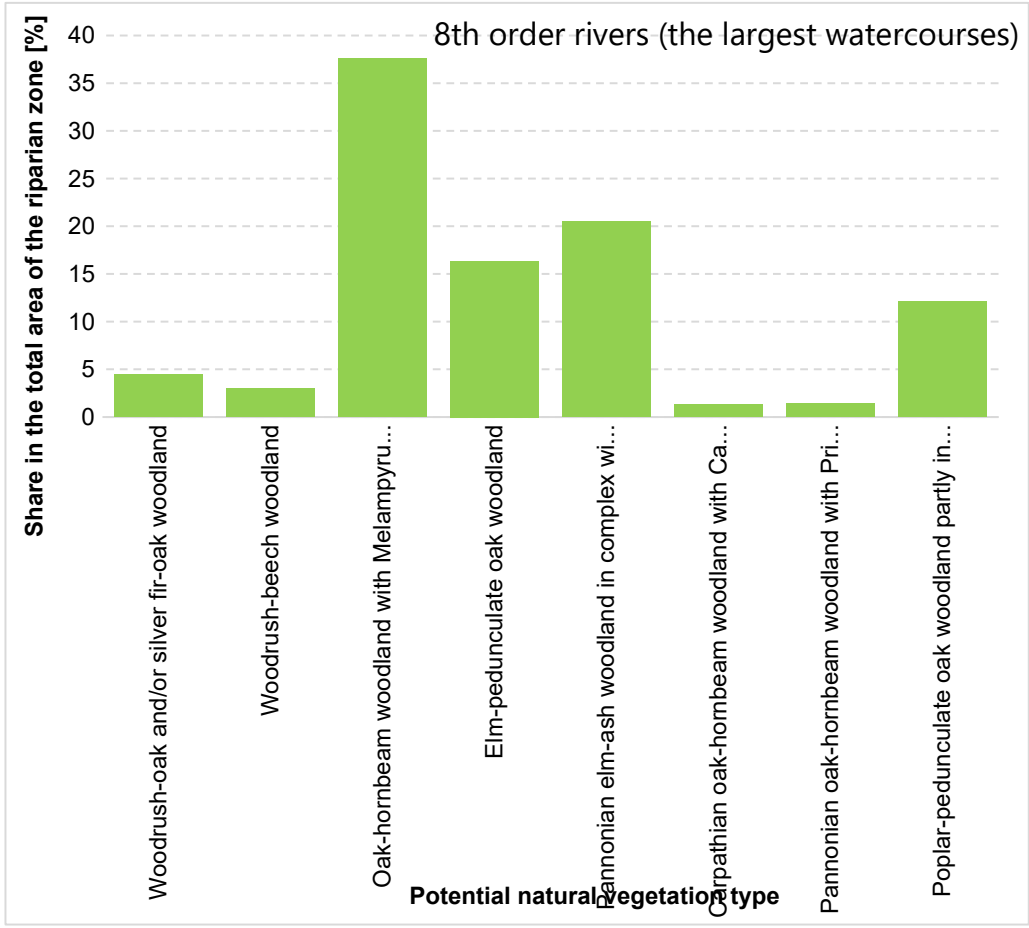


Potential natural status of riparian zones

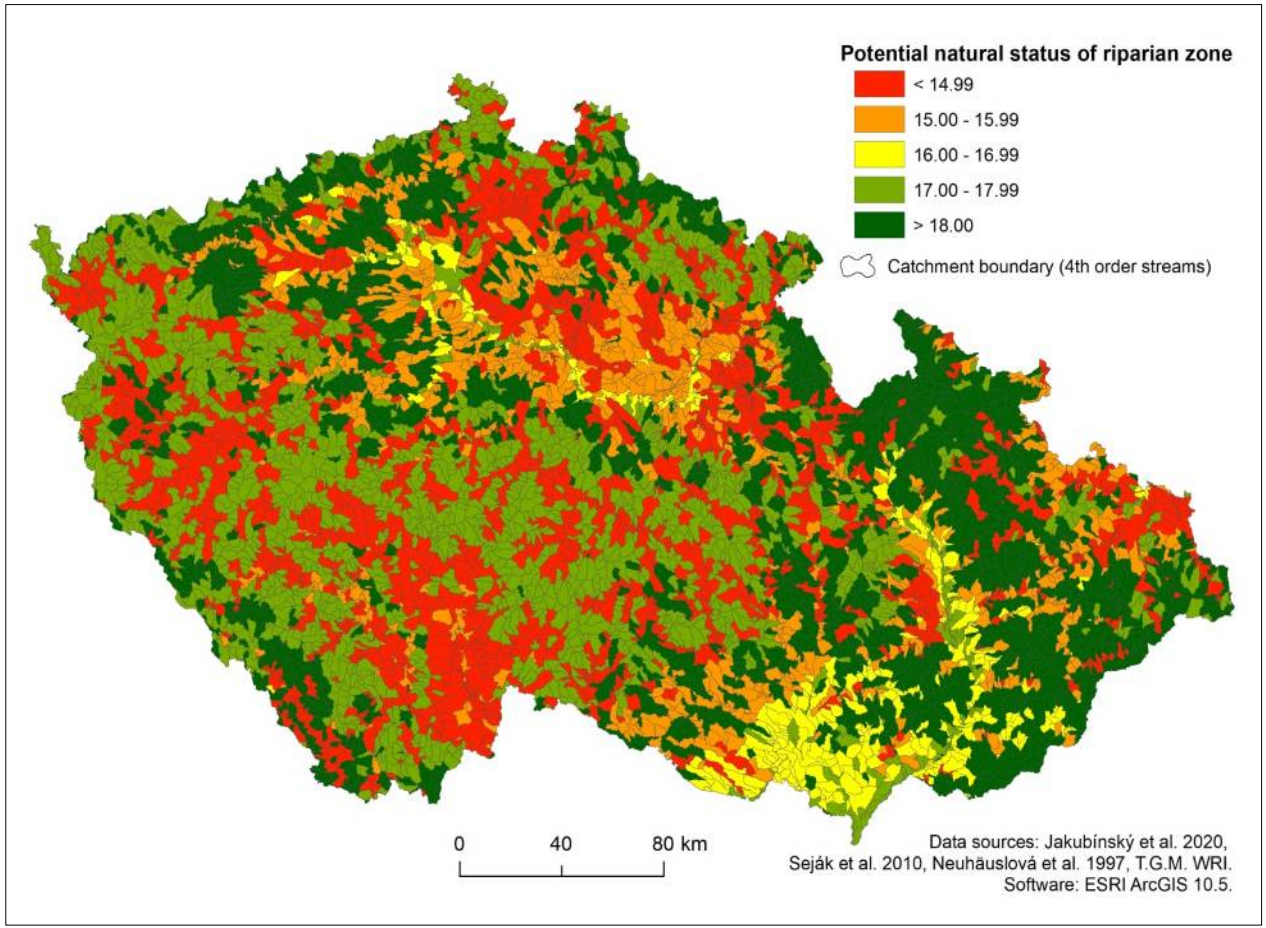
Most Common Potential Vegetation in Riparian Zones	Area (km^2)	Share in All Riparian Zones in Czechia (%)
Woodrush-oak and/or silver fir-oak woodland	192.1	19.22
Woodrush-beech woodland	160.0	16.02
Oak-hornbeam woodland with *Melampyrum nemorosum*	172.2	17.23
Beech woodland with *Dentaria enneaphyllos*	136.2	13.63
Carpathian oak-hornbeam woodland with *Carex pilosa*	44.4	4.44
Bird cherry-ash woodland partly in complex with alder carrs	26.1	2.61
Bird cherry-pedunculate oak- or -alder woodland with *Carex brizoides*, partly in complex with alder carrs, reed swamps and tall-sedge communities	3.53	0.35
Elm-pedunculate oak woodland	8.91	0.89
Pannonian elm-ash woodland in complex with poplar-ash woodlands	2.23	0.22
Total	**745.5**	**74.63**

Potential natural status of riparian zones – the most common habitats





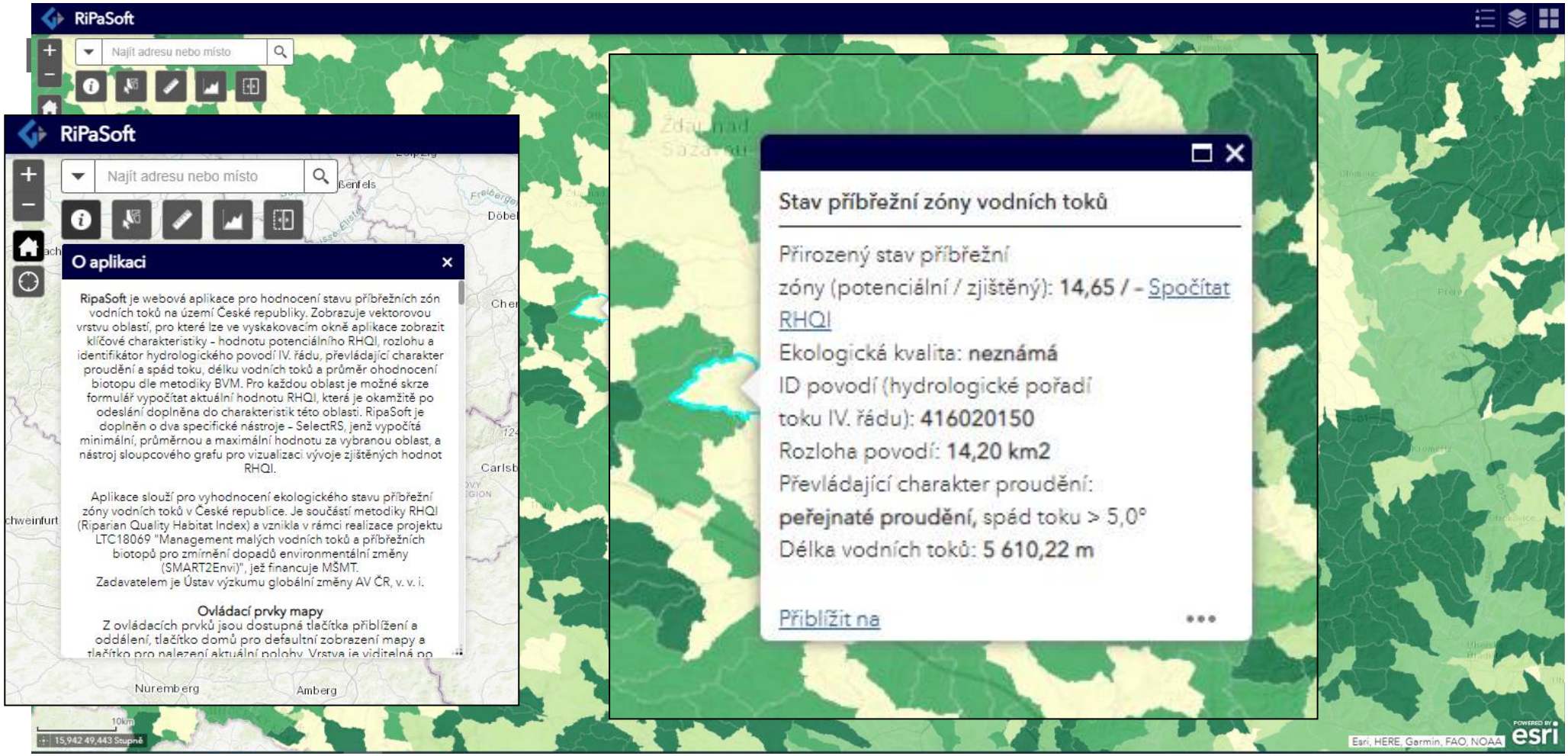
Potential natural status of riparian zones – within the 4th order stream catchments



„RipaSoft“ tool to facilitate the assessment of the ecological status of riparian zone

- the aim of the tool is to streamline the procedure for calculating the ecological status of riparian zones using the RHQI methodology
- automation of current status calculation (data from field form)
- determination of the potential natural state of RZ in a given place („reference“ state)
- comparison of current and potential natural state = final RHQI value
- the record is stored in the database and the resulting value is made available to all RipaSoft users
- the tool is freely available on the website (within the „IMALBES“ platform) at www.imalbes.cz


RiPaSoft
Najít adresu nebo místo
Welcome to RipaSoft!
RipaSoft is an online interface for evaluating the ecological status of the riparian zone in the Czech Republic.
The application is part of the RHQI (Riparian Habitat Quality Index) methodology. Instructions for working with the application and interpreting the results can be found on the "How to proceed". To display the layer, it is necessary to zoom the map to any area of the Czech Republic.
The application was created within the implementation of the project LTC18069 "Management of small watercourses and riparian habitats to mitigate the effects of environmental change (SMART2Envi)", funded by the Ministry of Education.
CzechGlobe
Ústav výzkumu globální změny AV ČR, v. v. i.
KATEDRA GEOINFORMATIKY
Univerzita Palackého v Olomouci
OK
Stav aplikace
Kliknutím obnovíte rozsah mapy a viditelnost vrstvy tam, kde jste skončili.

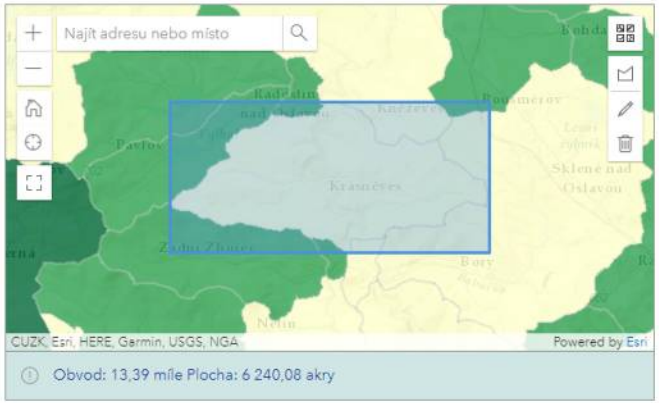

RiPaSoft
Najít adresu nebo místo
O aplikaci
RipaSoft je webová aplikace pro hodnocení stavu příbřežních zón vodních toků na území České republiky. Zobrazuje vektorovou vrstvu oblastí, pro které lze ve vyskakovacím okně aplikace zobrazit klíčové charakteristiky – hodnotu potenciálního RHQI, rozlohu a identifikátor hydrologického povodí IV. řádu, převládající charakter proudění a spád toku, délku vodních toků a průměr ohodnocení biotopu dle metodiky BVM. Pro každou oblast je možné skrze formulář vypočítat aktuální hodnotu RHQI, která je okamžitě po odeslání doplněna do charakteristik této oblasti. RipaSoft je doplněn o dva specifické nástroje – SelectRS, jenž vypočítá minimální, průměrnou a maximální hodnotu za vybranou oblast, a nástroj sloupcového grafu pro vizualizaci vývoje zjištěných hodnot RHQI.
Aplikace slouží pro vyhodnocení ekologického stavu příbřežní zóny vodních toků v České republice. Je součástí metodiky RHQI (Riparian Quality Habitat Index) a vznikla v rámci realizace projektu LTC18069 "Management malých vodních toků a příbřežních biotopů pro zmírnění dopadů environmentální změny (SMART2Envi)", jež financuje MŠMT.
Zadavatelem je Ústav výzkumu globální změny AV ČR, v. v. i.
Ovládací prvky mapy
Z ovládacích prvků jsou dostupná tlačítka přiblížení a oddálení, tlačítko domů pro defaultní zobrazení mapy a tlačítko pro nalezení aktuální polohy. Vrstva je viditelná po
Nuremberg
Amberg
Stav příbřežní zóny vodních toků
Přirozený stav příbřežní zóny (potenciální / zjištěný): 14,65 / – Spočítat RHQI
Ekologická kvalita: neznámá
ID povodí (hydrologické pořadí toku IV. řádu): 416020150
Rozloha povodí: 14,20 km2
Převládající charakter proudění: peřejnaté proudění, spád toku > 5,0°
Délka vodních toků: 5 610,22 m
Přiblížit na
Esri, HERE, Garmin, FAO, NOAA
esri

Welcome!
This form is used to calculate the RHQI based on data obtained from riparian zone field mapping. The resulting value will be compared with the potential RHQI value for the given riparian zone in the map application RipaSoft.

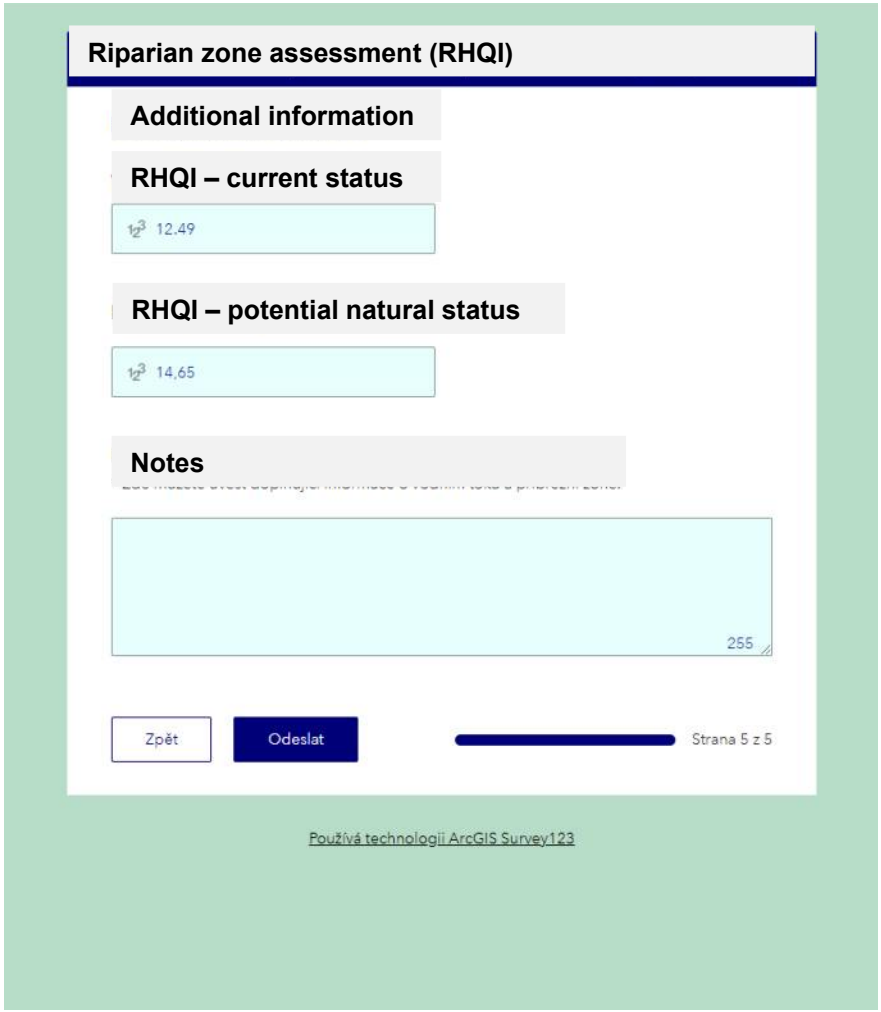
River / stream*

Number of the river reach*

Location of the riparian zone reach*



Date of mapping*



RHQI – current status

RHQI value	Category	Name
< 3.9	I	High
4.0-7.9	II	Good
8.0-11.9	III	Moderate
12.0-15.9	IV	Poor
> 16.0	V	Bad

RHQI – potential natural status

<11.3, 21.0>

Conclusions

- Riparian zones generally play a very important role in shaping the ecological status of watercourses and the entire landscape and perform a wide range of ecosystem functions
- Total area of riparian zones - 1019 km^2
- Ca 1.29 % of the state area
- The assessment of the overall ecological status of riparian habitats constitutes an important source of information for the needs of watercourse management and landscape planning in the riparian landscape, the aim of which should be to maintain good status or to improve the current unsatisfactory state of these habitats.
- Ca 26 % of all river basins in the Czech Republic reach very low environmental values of the potential natural status of riparian zones

Thank you for your attention.

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