

Bird Study – Presentation of results as a basis for need for action

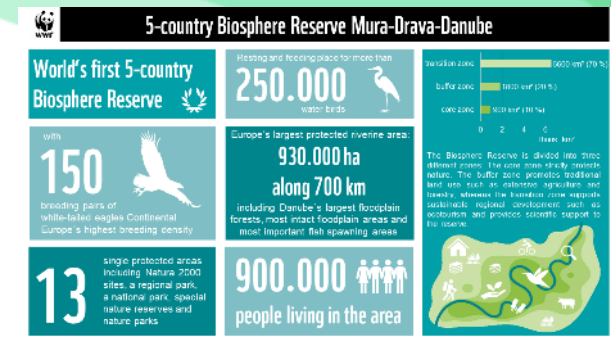
Monika Podgorelec,

Institute of the Republic of Slovenia for Nature Conservation

Mid-term conference, 24th November 2021

Project co-funded by European Union funds (ERDF, IPA)

Background



- In September 2021, the 5-country TBR MDD biosphere reserve was declared
- The right time to start joint monitoring river breeding bird species throughout the TBR MDD
- Good basis: Action plan for river birds in the planned five-country Biosphere Reserve “Mura-Drava-Danube” (Revital 2019 - M. Gattermayr et. all, project DRAVA LIFE)



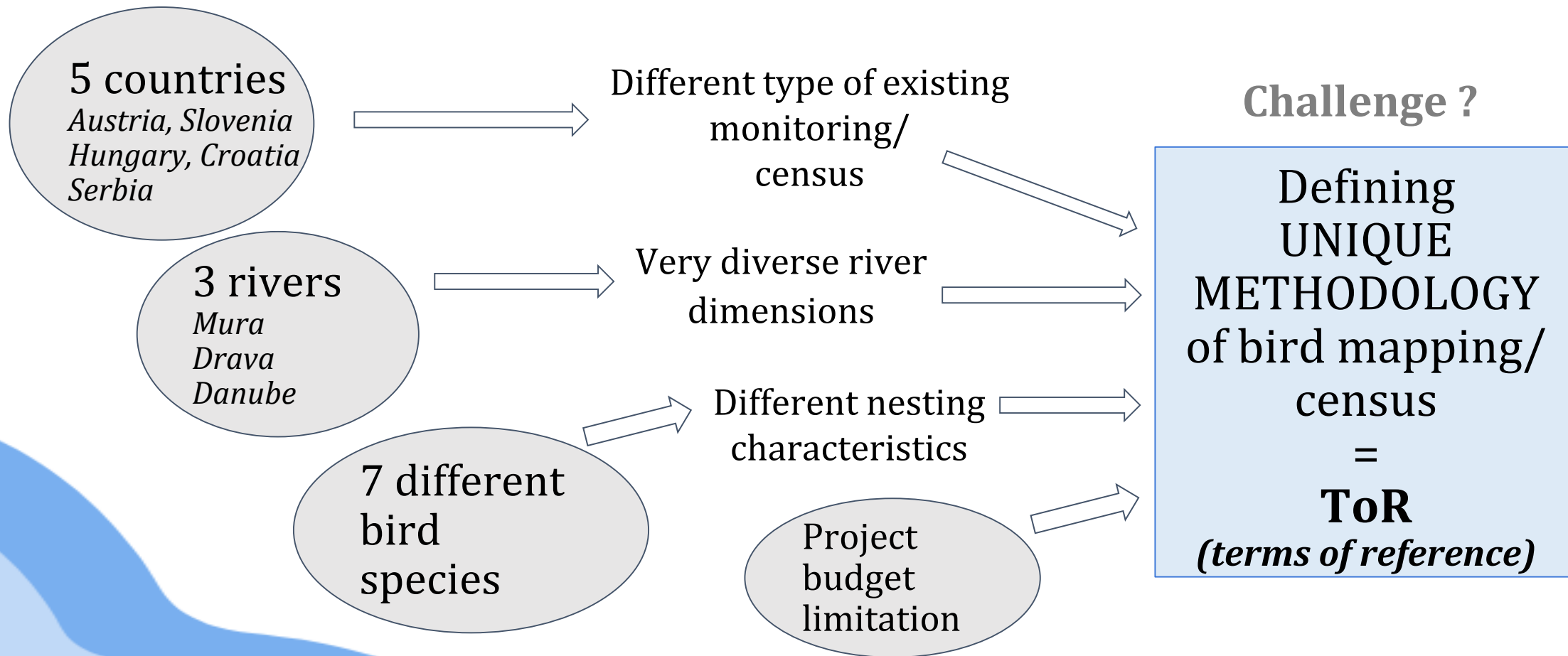
provides insight into the distribution of seven target species based on existing data from several TBR MDD institutions



Study aims to:

- Implement first ever complete 5-country field mapping of seven key river birds in 2021 & 2022 (IRSNC, INCVP, WWF Adria)
- Gain a coherent picture of the status quo of indicator river birds within TBR MDD **in 2021** and 2022
- Gain a wide view on biodiversity and ecosystem connectivity in TBR MDD regarding river birds as an bio-indicator
- Use the results of mapping to define the potential restoration sites on Mura, Drava and Danube
- Use this results together with future continuous long-term river birds monitoring as a tool for the impact assessment of restoration projects

First transboundary river birds mapping in TBR MDD 2021 & 2022



**River dynamics and natural morphological processes
are
a key priority to conserve the river breeding birds.**



Gravel bar



Mura SLO-HR, Luka Božič

Gravel and sand bar breeders

Eroded steep bank



Drava CRO, Monika Podgorelec

Steep bank breeders

Indicator bird species



Little tern (*Sternula a.*)



Common tern (*Sterna a.*)



Little ringed plover (*Charadrius dubius*)



Common sandpiper (*Actitis hypoleucos*)



Kingfisher (*Alcedo atthis*)



Sand martin (*Riparia a.*)



Bee-eater (*Merops apiaster*)

 Birds nesting in colonies

Already achieved ...

- ✓ review of the **existing literature** on river bird monitoring
- ✓ review of the **mapping practices** on existing river bird monitoring in TBR MDD countries (*protocol, census method*)
- ✓ meetings with bird experts
- ✓ **prepared unique methodology** → **ToR (*terms of reference*)**


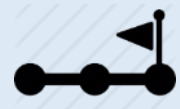
- ✓ **1st river bird mapping in TBR MDD in 2021** by experts

- **Mura (SLO): DOPPS Birdlife Slovenia** (L. Božič)
- **Mura, Drava & Danube (HR): Natural History Society Drava** (I.D. Grlica)
- **Danube (RS): University of Novi Sad, Faculty of Science,**

Department for Biology and Ecology (D. Radišić)



ToR in short

- 1 round per year
- 7 key bird species + additional interesting bird species
 - ↳ **nesting pairs** and **non-nesting** individuals
- Time frame: end of April – July → At least 10 days after high water levels (if possible, based on weather conditions and water levels)
- Tools: rafts/boats, binoculars, GPS, good quality camera 
- Rivers divided in sections (based on expert experiences)
 - Mura: sections (SI-AT, SI-HR) + section (HR-HU)
 - Drava (HR-HU)
 - Danube (HR – right river bank, RS – left river bank) 
- Data storage: unified data collecting (attribute) table of the .shp
- Also collecting photo data of the breeding sites

Field surveys 2021 overview

First Joint River Breeding Bird Mapping of the 550 km Mura – Drava – Danube River Corridor

142 km Mura River

273 km Drava River

135 km Danube River

Mura River

142 rkm – 49 rkm =
93 km

Mura River

49 rkm – 0 rkm =
49 km

Drava River

320 rkm – 0 rkm =
273 km (not accumul. lakes)

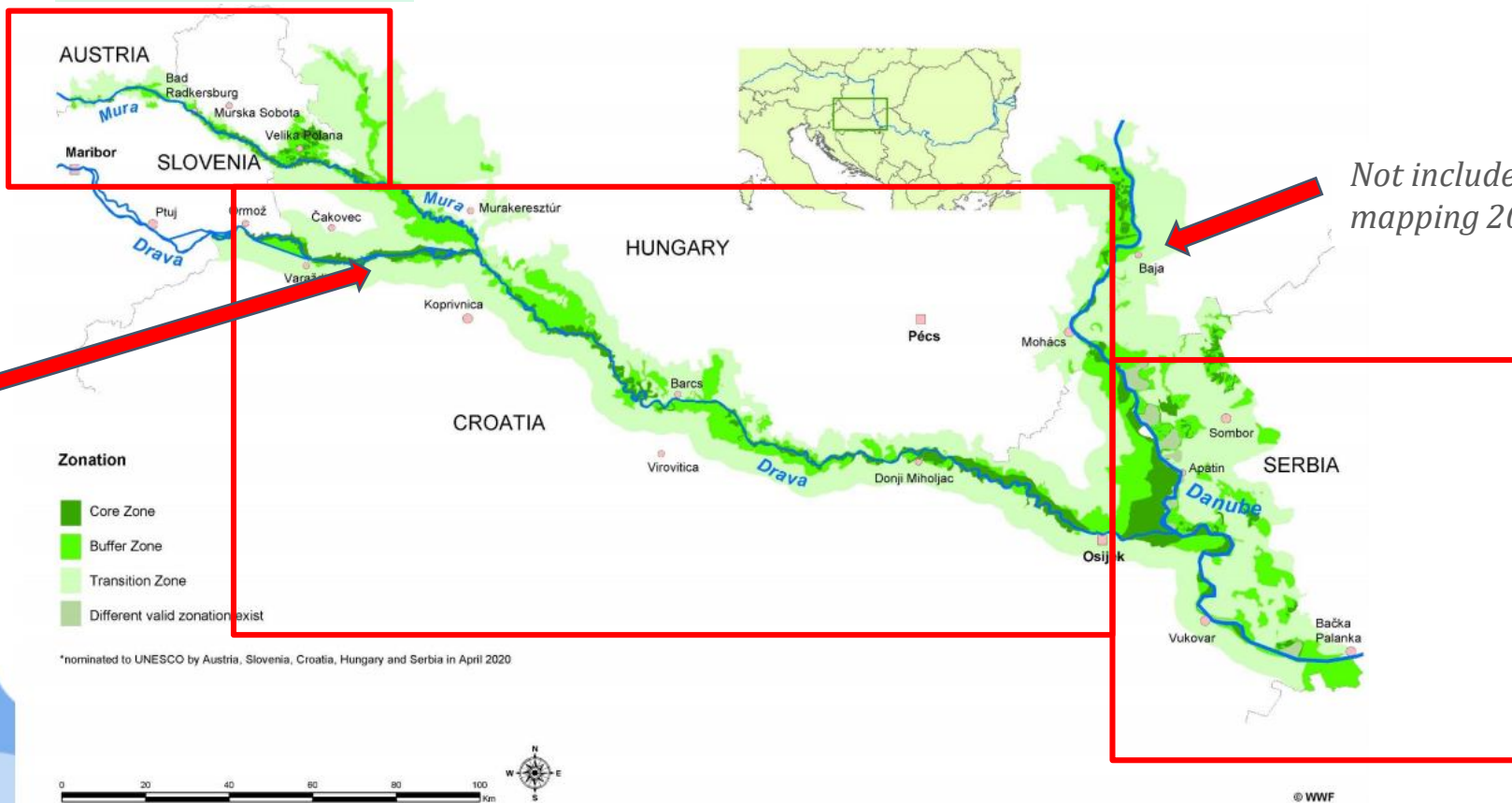
Danube River –right bank

1425 rkm -1299 rkm =
126 km

Danube River – left bank

1433 rkm -1298 rkm =
135 km

47 km not included in the bird mapping due to 3 accumulation lakes & power plants (Ormož, Varaždin, Dubrava)



Not included in bird mapping 2021 and 2022

Field surveys 2021 overview

142 km Mura river bed

SI/AT - SI/HR Mura River

- Ceršak - Dekanovec
- 93 km
- 5 field days (+ 1)
- 30,9 km/day („one day effort“)
- 2 Mapping

- *Additional: 4 gravel pits near the riverbed near (SI – Melinci, Krapje, Dobrovnik & HR – Križovec)*



HR/HU Mura River

- Dekanovec – Legrad
- 49 km
- 1 field day
- 49 rkm/day („one day effort“)
- 1 Mapping

Natural History Society Drava

273 km Drava river bed

HR/HU – Drava River

- Lovrečan – Aljmaš
- 273 km
- 6 field days (+1)
- 45,5 rkm/day („one day effort“)
- 1 Mapping

- *Additional: gravel pit Šoderica lake, Botovo (Koprivnica)*

Natural History Society Drava

135 km Danube river bed

RS – Danube River – left bank

- Bezdan - Bačka Palanka
- 135 km
- 6 field days
- 22,5 rkm/day („day effort“)
- 1 Mapping

- *Additional: more significant river tributaries accessed by boat (Mišvald, Hagla)*



HR – Danube River – right bank

- Batina – Ilok
- 126 km
- 2 field days
- 63 rkm/day („one day effort“)
- 1 Mapping



Results review – first draft

Status quo of the 7 key river birds species in TBR MDD in 2021:

1. Estimation of the breeding population size (species/river)
2. Spatial distribution in the TBR MDD
3. Linear density of key bird species per 10 river kilometer sections

1. Estimation of the breeding population size (species/river)



Little tern (*Sternula albifrons*)



Common tern (*Sterna hirundo*)



Little ringed plover (*Charadrius dubius*)



Common sandpiper (*Actitis hypoleucos*)



Kingfisher (*Alcedo atthis*)



Sand martin (*Riparia riparia*)



Bee-eater (*Merops apiaster*)

Mura River SLO/AT – SLO – SLO/HR



Mura TBR MDD: river birds population size in 2021

Ceršak (SI-AT) – Legrad (HR-HU); 142 rKM – 0 rKM; 142 m

- 428 data (other birds sp.included): 240 nesting birds, 188 non-nesting individuals

Species	No. of breeding sites / No. of colonies	No. of pairs / Population size estimation	Linear density (pairs per km)
Little Tern	0	0	0
Common Tern	0	0	0
Little-ringed Plover	78	78	0,55 pairs per km
Common Sandpiper	71	71	0,5 pairs per km
Sand Martin	19	879	6,2 pairs per km
Common Kingfisher	57	57	0,4 pairs per km
European Bee-Eater	2	14	0,1 pairs per km

Gravel pit Križovec (HR) near the riverbed

Sand martin	2275 pairs / 3 colonies
Bee-eater	88 pairs / 4 colonies

Gravel pit Melinci (SI) near the riverbed

Sand martin	11 pairs / 1 colony
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* the report gives an estimate of the min and max number of pairs; here in the table is considered max. number of pair



Common tern (*Sterna hirundo*)



Common sandpiper (*Actitis hypoleucos*)



Sand martin (*Riparia riparia*)



Kingfisher (*Alcedo atthis*)



Little ringed plover (*Charadrius dubius*)

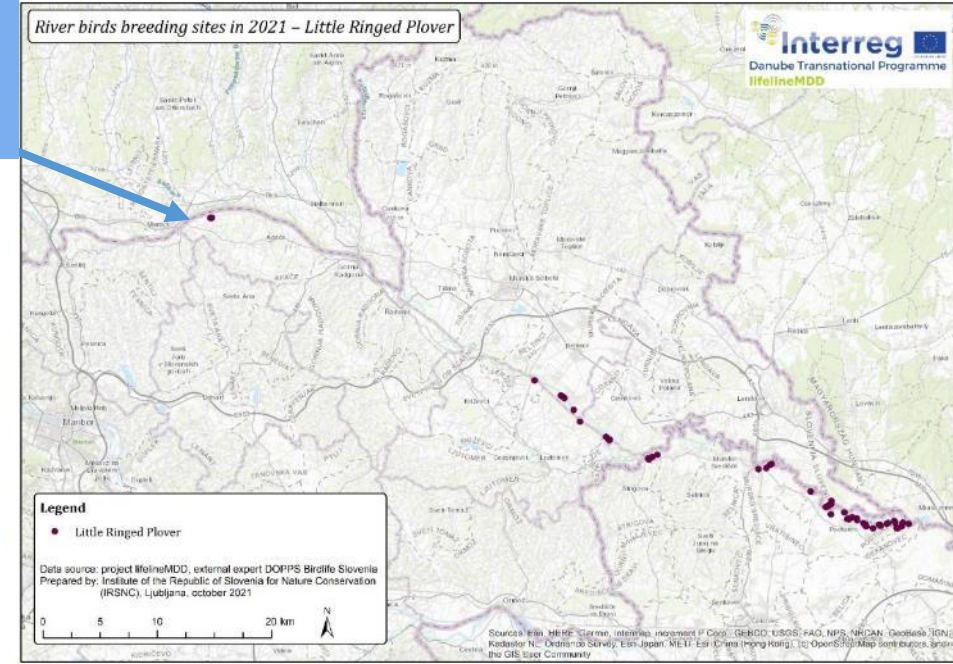
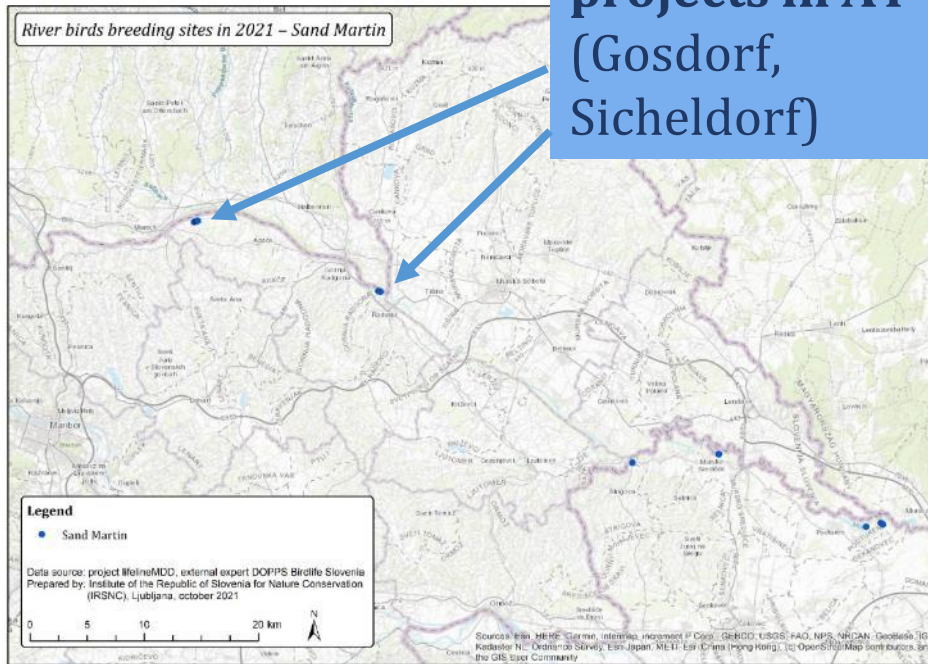
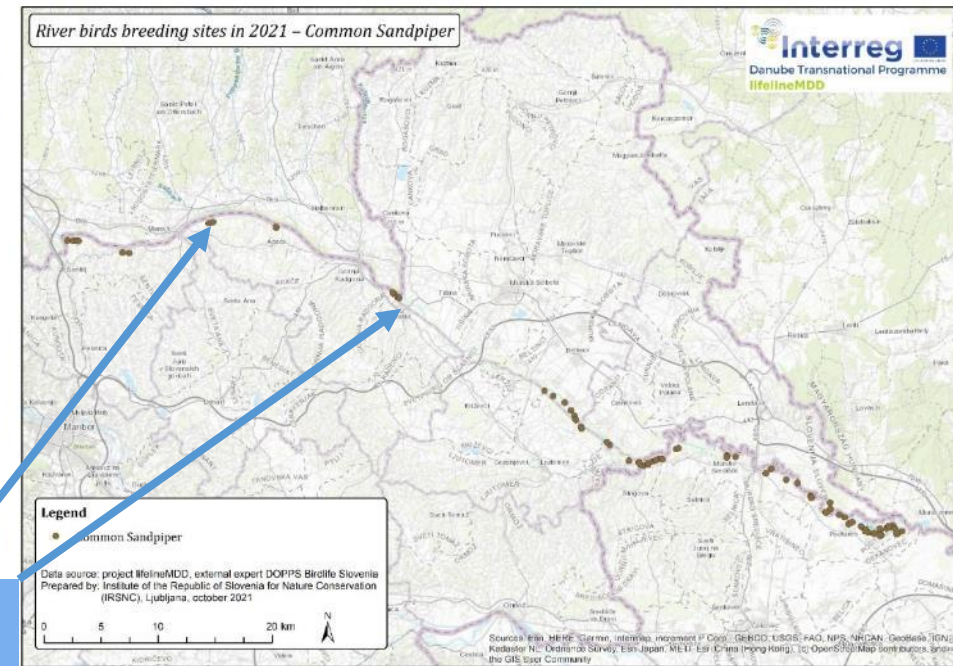
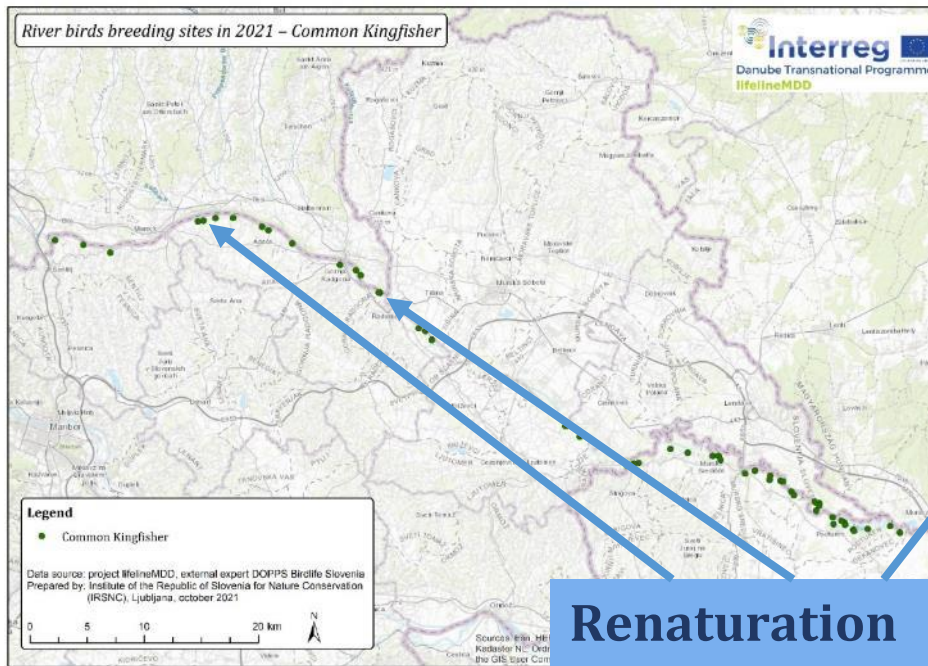


Little tern (*Sternula albifrons*)



Bee-eater (*Merops apiaster*)

**Mura River
 SLO/AT**



**Renaturation
 projects in AT
 (Gosdorf,
 Sieldorf)**

Drava River HR/HU



Drava TBR: river birds population size in 2021

Lovrečan – Aljmaš; 320 rKM – 0 rKM; 273 km*

**(sections between hydroaccumulations and powerplants on the upper part not included)*

- 331 data (other birds sp.included): 171 nesting birds, 160 non-nesting individuals

Šoderica lake (HR) near the riverbed

Sand martin	2270 pairs / 4 colonies
Bee-eater	4 pairs / 1 colony
Common tern	70 pairs / 1 colony



Common tern (*Sterna hirundo*)

Species	No. of breeding sites / No. of colonies	No. of pairs / Population size estimation	Linear density (pairs per km)
Little Tern	0	0 (+4 individuals on 2 locations)	0
Common Tern	0	0 (+37 individuals on 13 locations)	0
Little-ringed Plover	21	21	0,08 pairs per km
Common Sandpiper	8	8	0,03 pairs per km
Sand Martin	32	7979	29,1 pairs per km
Common Kingfisher	81	81	0,3 pairs per km
European Bee-Eater	22	309	1,1 pairs per km

* the report gives an estimate of the min and max number of pairs; here in the table is considered max. number of pair

Danube River



Danube TBR: river birds population size in 2021

Batina/Bezdan – Ilok/Bačka Palanka ; 1433 rKM – 1298 rKM; 135 km

(Both banks - right and left river bank)

- 343 data (other birds sp. NOT included): 101 nesting birds, 242 non-nesting individuals

Species	No. of breeding sites / No. of colonies	No. of pairs * / Population size estimation	Linear density (pairs per km)
Little Tern	1	1	0,0 pairs per km
Common Tern	0	0 (* individual)	0
Little-ringed Plover	5 island	11	0,08 pairs per km
Common Sandpiper	0	0 (* >100 individual)	0
Sand Martin	13	851	6,3 pairs per km
Common Kingfisher	61	61	0,45 pairs per km
European Bee-Eater	16	133	1,0 pairs per km



Little tern (*Sternula albifrons*)

Mura

-

Drava

-

Danube



Mura-Drava-Danube: river birds population size in 2021

Ceršak (SI/AT) – Ilok/Bačka Palanka (HR/RS); 142 rKM – 1298 rKM; 550 km

Gravel pit Križovec (HR) near the riverbed

Sand martin	2275 pairs / 3 colonies
Bee-eater	88 pairs / 4 colonies

Šoderica lake (HR) near the riverbed

Sand martin	2270 pairs / 4 colonies
Bee-eater	4 pairs / 1 colony
Common tern	70 pairs / 1 colony

Species	No. of breeding sites / No. of colonies	No. of pairs * / Population size estimation	Linear density (pairs per km)
Little Tern	1	1 (+4 individual)	0,0 pairs per km
Common Tern	0	0 (+ 38 individual)	0
Little-ringed Plover	104	110	0,2 pairs per km
Common Sandpiper	79	79 (+ >100 individual)	0,14 pairs per km
Sand Martin	64	9709	17,7 pairs per km
Common Kingfisher	199	199	0,36 pairs per km
European Bee-Eater	40	456	0,83 pairs per km

„Action plan TBR MDD“: River birds population size 2011-2016

(Revital 2019 - M. Gattermayr et. all, project DRAVA LIFE)

OVERVIEW OF MAIN RESULTS



Mean numbers of breeding birds within TBR (2011-2016)

River bird species	Mean number of breeding pairs (2011 – 2016)	Minimum bp (2011 – 2016)	Maximum bp (2011 – 2016)
Little Tern	5	0	12
Common Tern	79	77	140
Common Sandpiper	45	7	89
Little Ringed Plover	110	29	221
Common Kingfisher	135	58	292
Sand Martin	7.220	3.972	13.315
European Bee-eater	420	277	696



Estimation of population size in TBR MDD

2011-2016 (Revital) & 2021 (lifelineMDD)

2011-2016	2021			
Mean number of breeding pairs (M. Gattermayr, Revital)	Species	No. of breeding sites / No. of colonies	No. of pairs * / Population size estimation	Linear density (pairs per km)
5	Little Tern	1	1 (+4 individual)	0,0 pairs per km
79	Common Tern	0	0 (+ 38 individual)	0
110	Little-ringed Plover	104	110	0,2 pairs per km
45	Common Sandpiper	79	79 (+ >100individual)	0,14 pairs per km
7220	Sand Martin	64	9709	17,7 pairs per km
135	Common Kingfisher	199	199	0,36 pairs per km
420	European Bee-Eater	40	456	0,83 pairs per km

2. Spatial distribution of seven key river birds species in TBR MDD in 2021



Little tern (*Sternula albifrons*)



Common tern (*Sterna hirundo*)



Little ringed plover (*Charadrius dubius*)



Common sandpiper (*Actitis hypoleucos*)



Kingfisher (*Alcedo atthis*)



Sand martin (*Riparia riparia*)

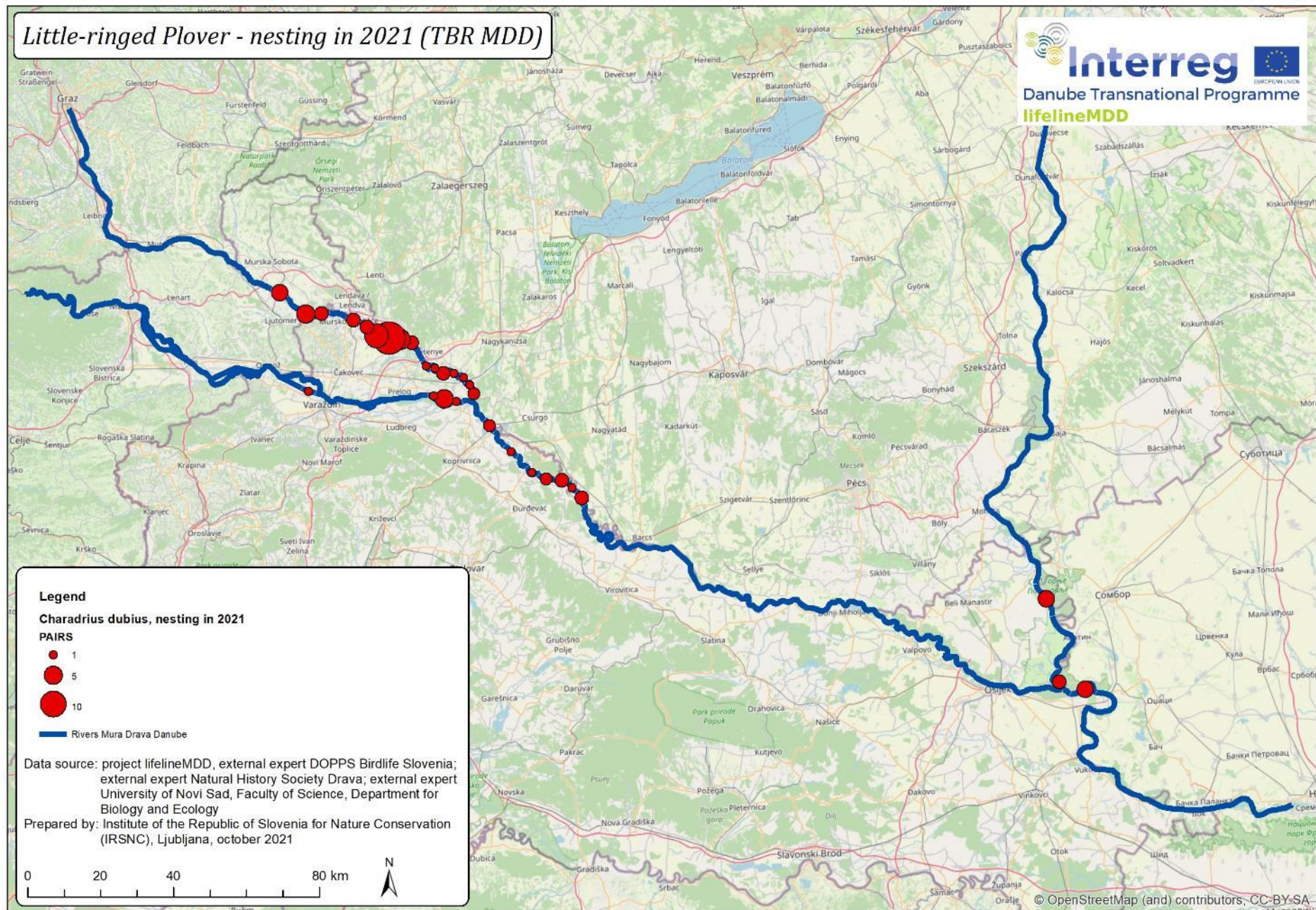


Bee-eater (*Merops apiaster*)



Little ringed plover (*Charadrius dubius*)

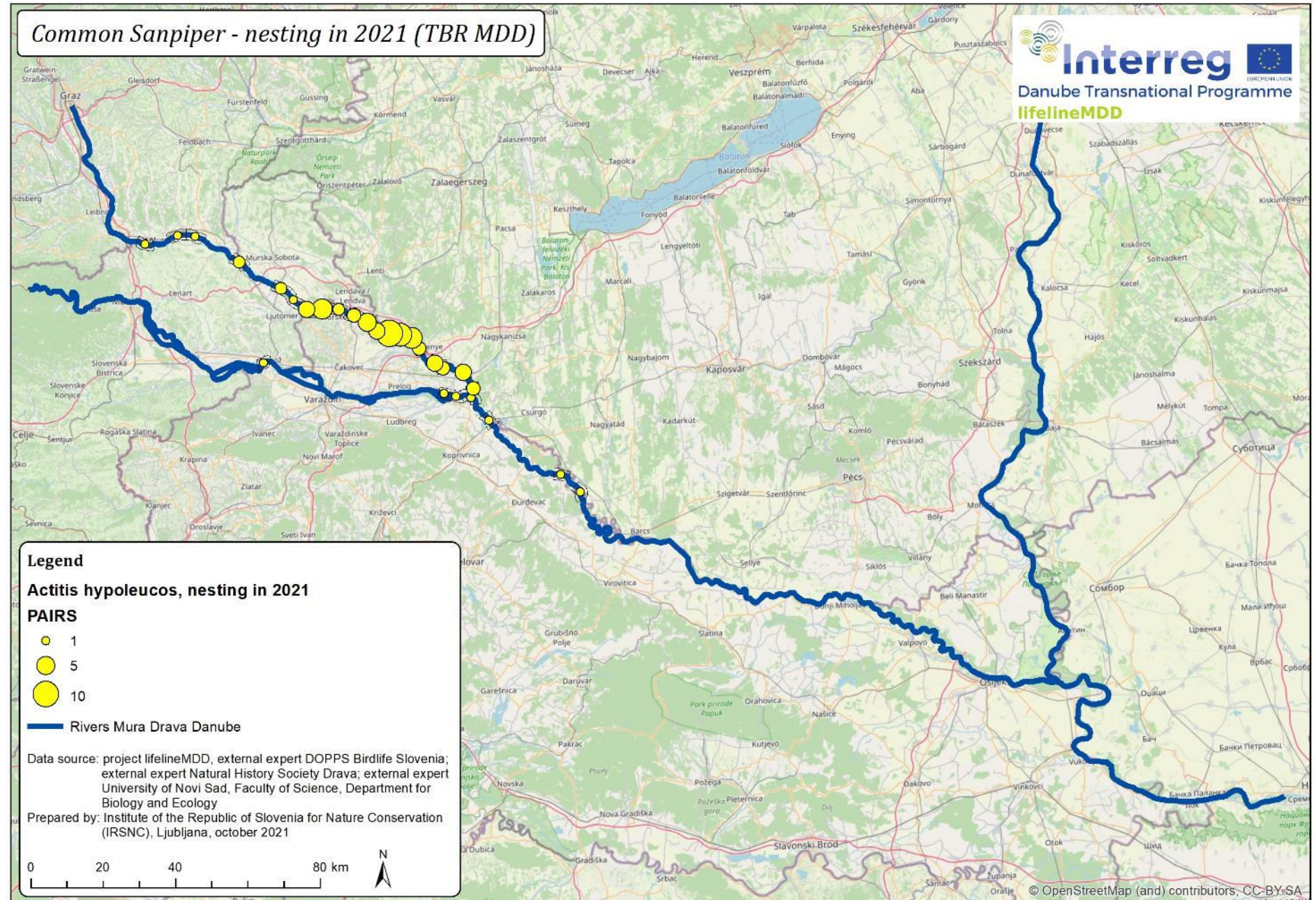
Nesting per
5 (*Mura, Drava*) or 10 (*Danube*)
river KM sections





Common sandpiper (*Actitis hypoleucos*)

Nesting per
 5 (*Mura, Drava*) or 10 (*Danube*)
 river KM sections





Common tern (*Sterna hirundo*)

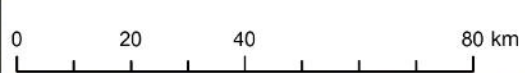
River birds breeding sites in 2021 (TBR MDD) – Common Tern

Šoderica lake (HR) near the Drava riverbed

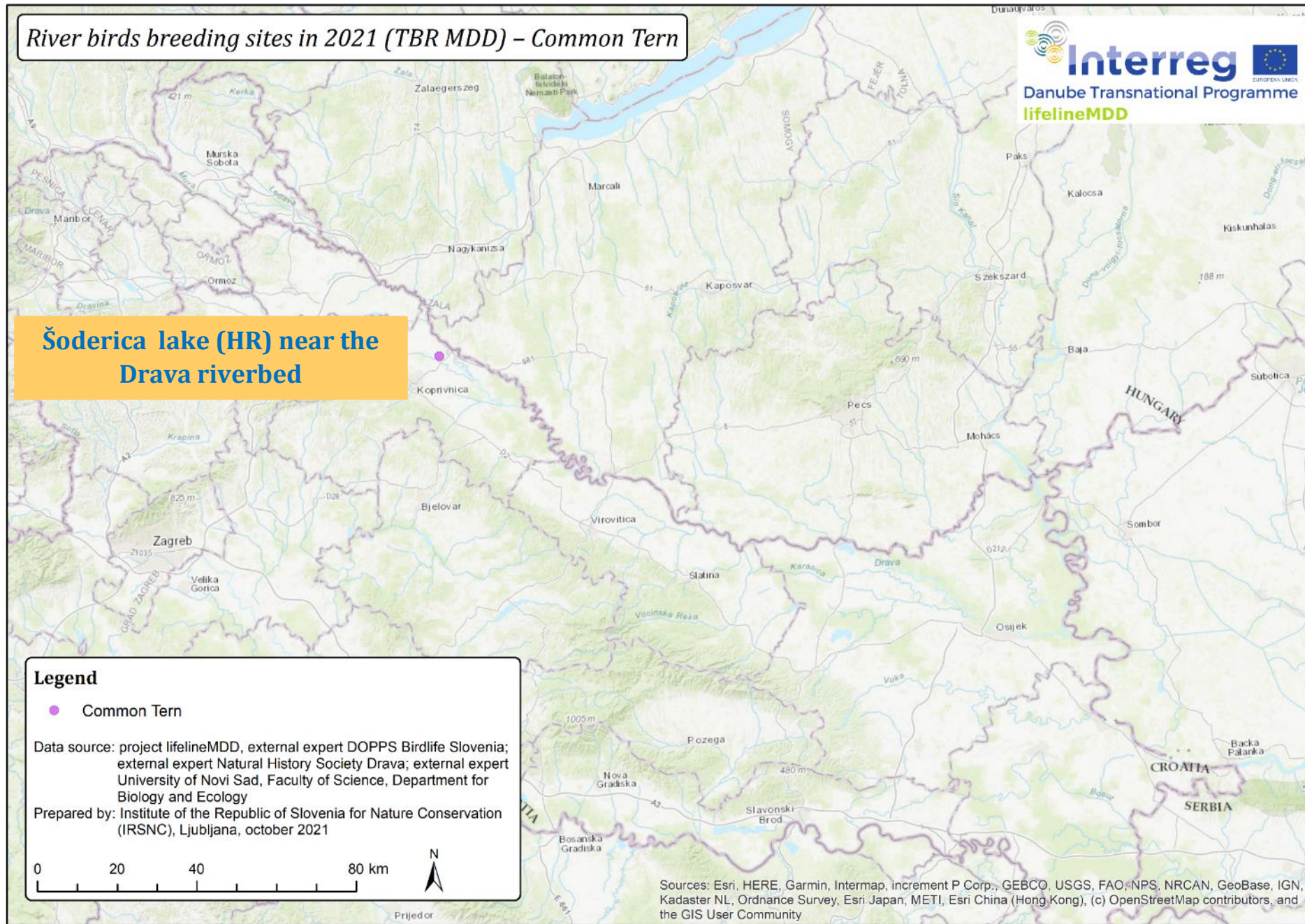
Legend

 Common Tern

Data source: project lifelineMDD, external expert DOPPS Birdlife Slovenia; external expert Natural History Society Drava; external expert University of Novi Sad, Faculty of Science, Department for Biology and Ecology
 Prepared by: Institute of the Republic of Slovenia for Nature Conservation (IRSNC), Ljubljana, october 2021

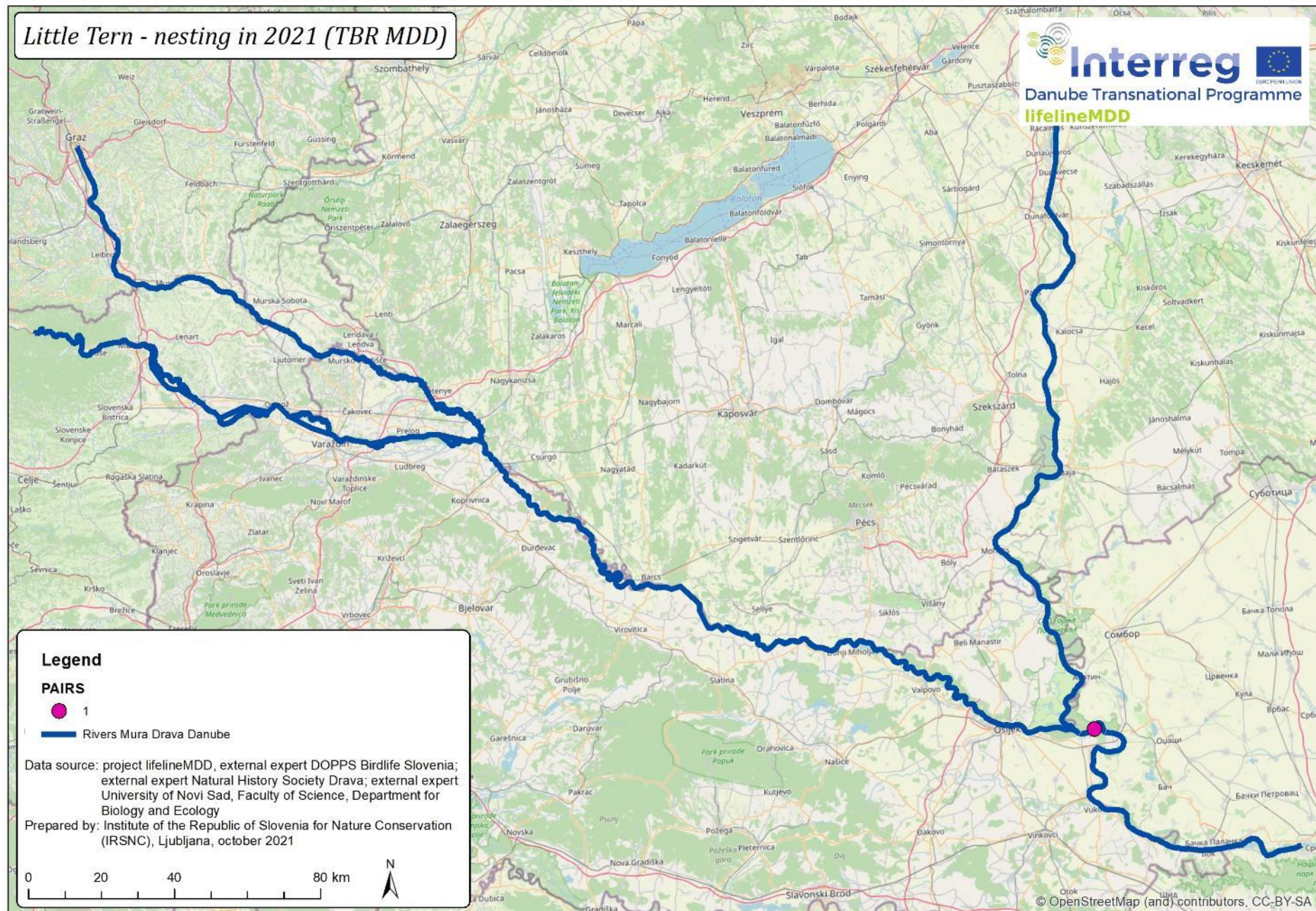


Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community





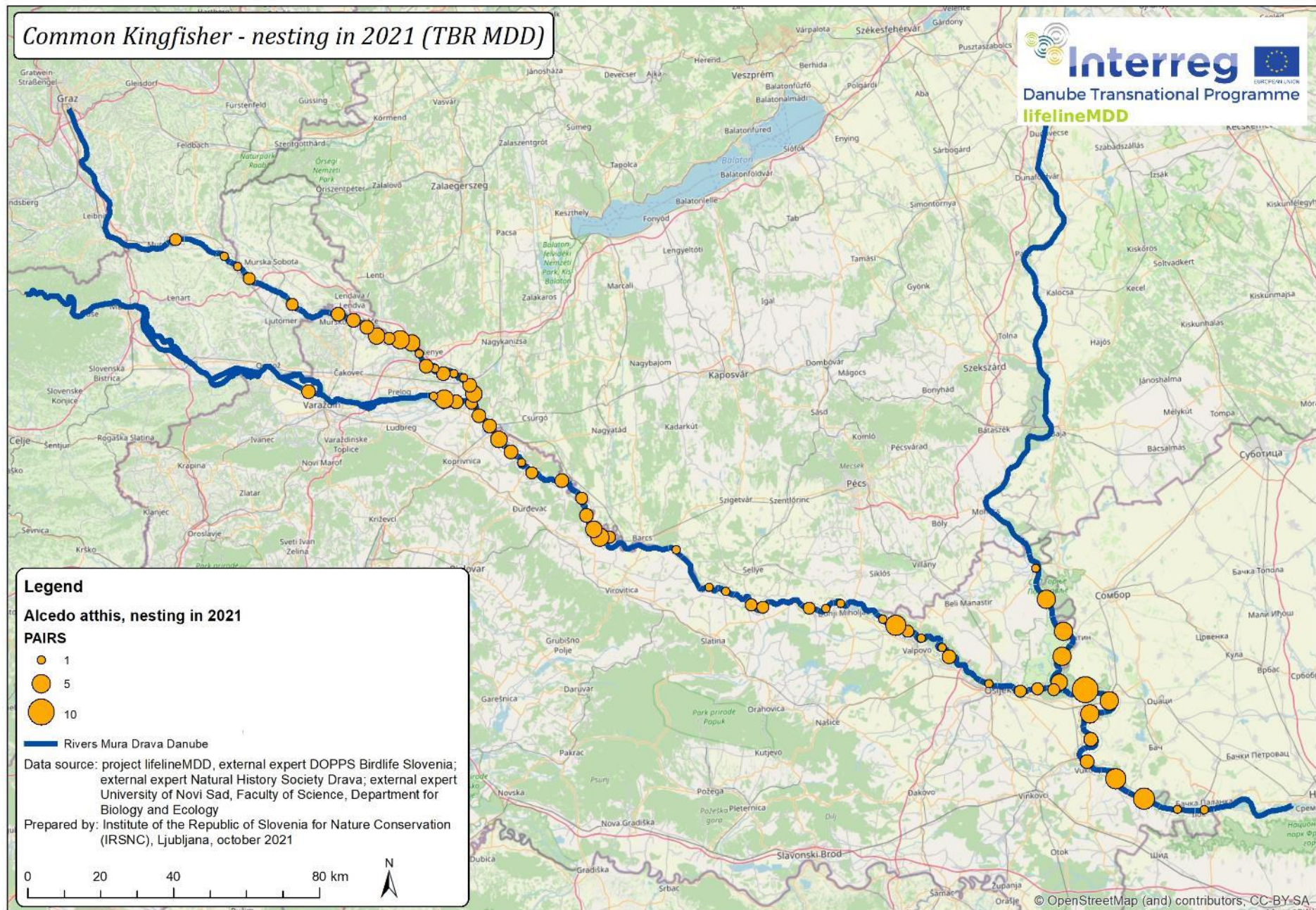
Little tern (*Sternula albifrons*)





Kingfisher (*Alcedo atthis*)

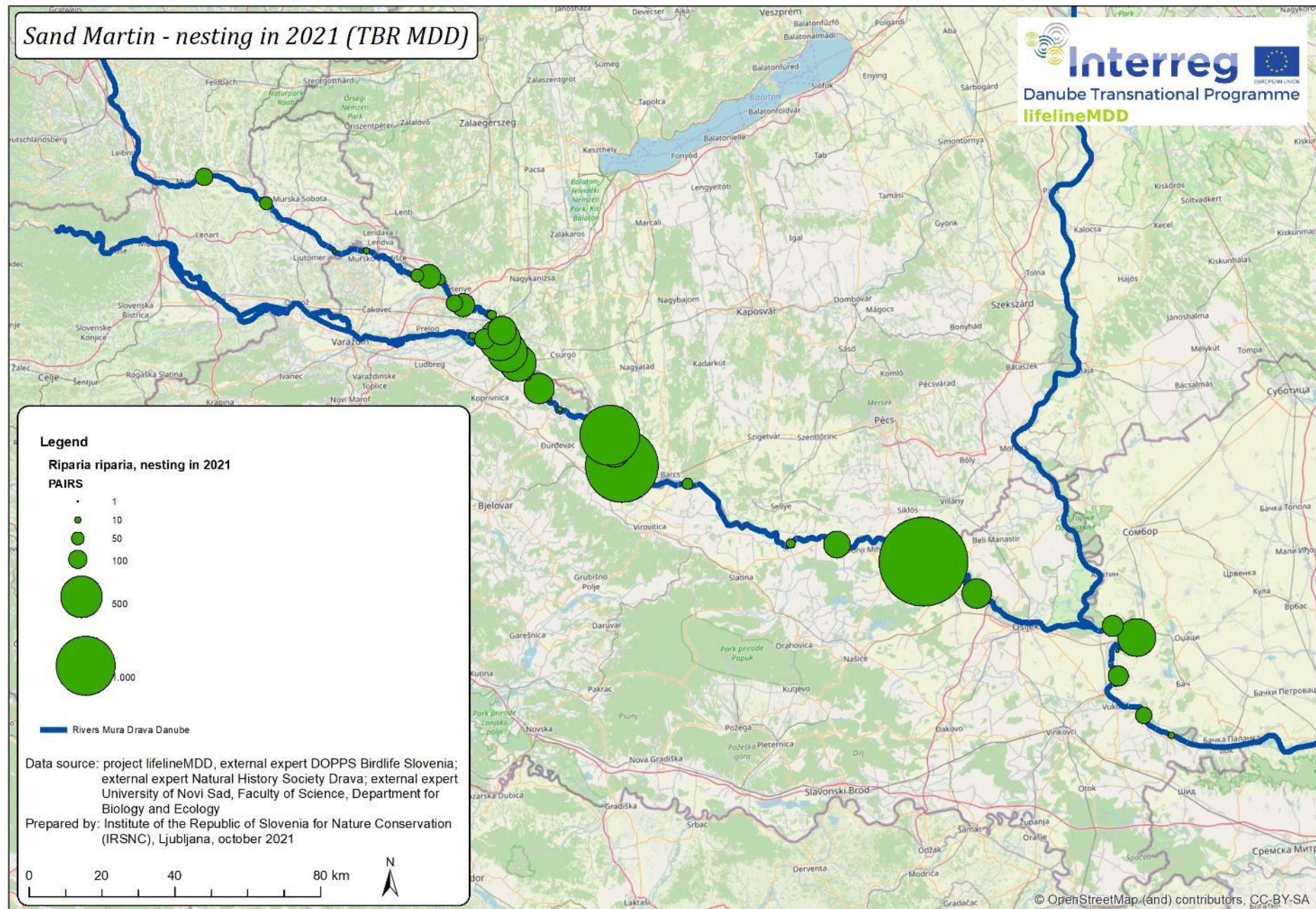
Nesting per
5 (*Mura, Drava*) or 10 (*Danube*)
river KM sections





Sand martin (*Riparia riparia*)

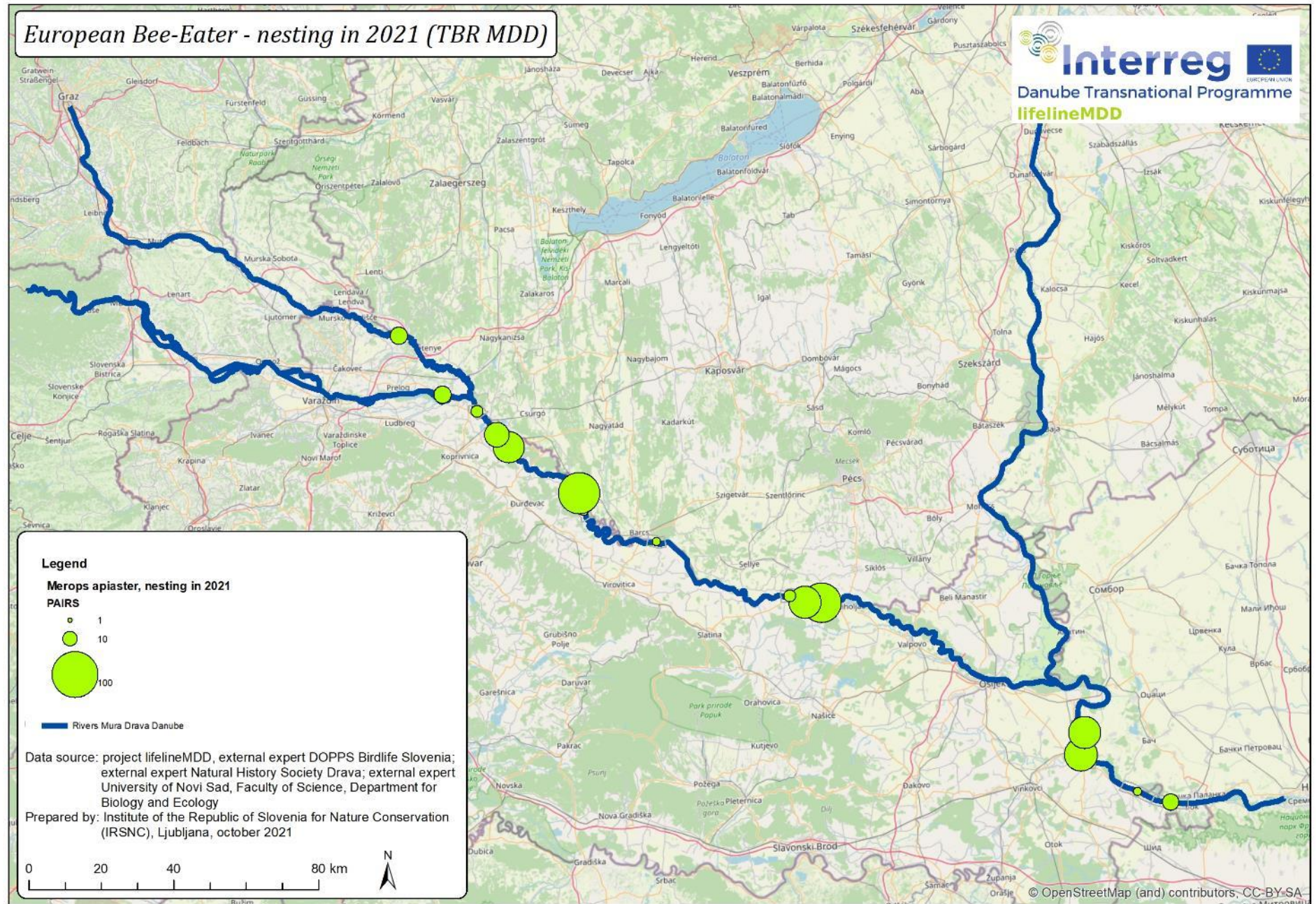
Nesting per
 5 (*Mura, Drava*) or 10 (*Danube*)
 river KM sections





Bee-eater (*Merops apiaster*)

Nesting per
5 (*Mura, Drava*) or 10 (*Danube*)
river KM sections



3. Linear density of key bird species per 10 river kilometres sections



Little tern (*Sternula albifrons*)



Common tern (*Sterna hirundo*)



Little ringed plover (*Charadrius dubius*)



Common sandpiper (*Actitis hypoleucos*)



Kingfisher (*Alcedo atthis*)



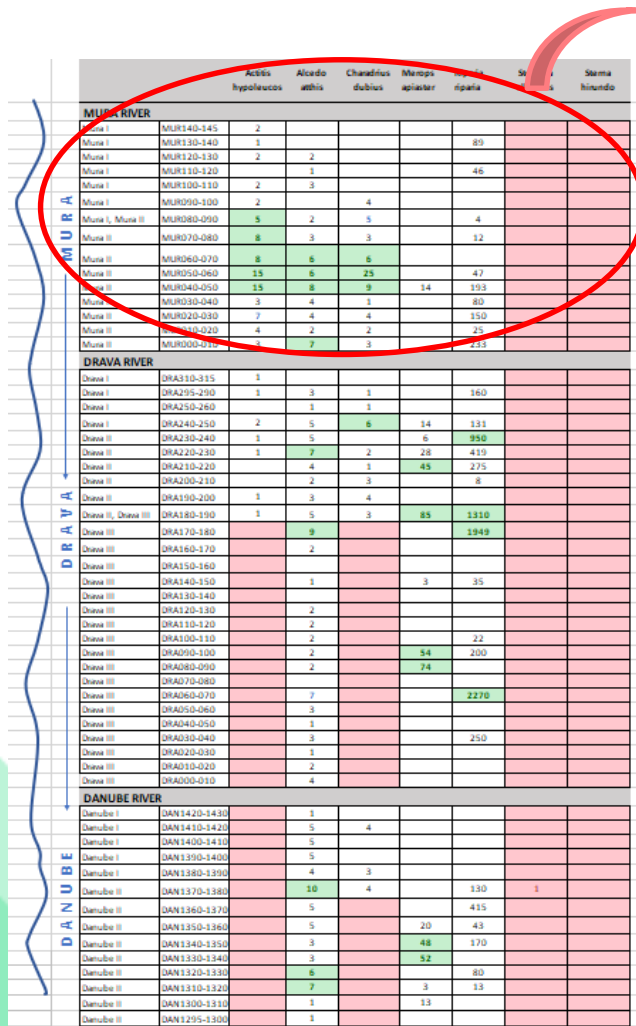
Sand martin (*Riparia riparia*)



Bee-eater (*Merops apiaster*)

MURA - Linear density per 10 river KM

(no. pairs in table/10)



MURA RIVER

		Actitis hypoleucos	Alcedo atthis	Charadrius dubius	Merops apiaster	Riparia riparia	Sterna albifrons	Sterna hirundo
Mura I	MUR140-145	2						
Mura I	MUR130-140	1					89	
Mura I	MUR120-130	2	2					
Mura I	MUR110-120		1					46
Mura I	MUR100-110	2	3					
Mura I	MUR090-100	2		4				
Mura I, Mura II	MUR080-090	5	2	5				4
Mura II	MUR070-080	8	3	3				12
Mura II	MUR060-070	8	6	6				
Mura II	MUR050-060	15	6	25				47
Mura II	MUR040-050	15	8	9	14			193
Mura II	MUR030-040	3	4	1				80
Mura II	MUR020-030	7	4	4				150
Mura II	MUR010-020	4	2	2				25
Mura II	MUR000-010	3	7	3				233

DRAVA RIVER

		Actitis hypoleucos	Alcedo atthis	Charadrius dubius	Merops apiaster	Riparia riparia	Sterna albifrons	Sterna hirundo
Drava I	DRA310-315	1						
Drava I	DRA295-290	1	3	1				160
Drava I	DRA250-260		1	1				
Drava I	DRA240-250	2	5	6	14			131
Drava II	DRA230-240	5	5	6	6			950
Drava II	DRA220-230	1	7	2	28			419
Drava II	DRA210-220		4	1	45			275
Drava II	DRA200-210		2	3	8			8
Drava II	DRA190-200	1	3	4				
Drava II, Drava III	DRA180-190	1	5	5	85			1310
Drava III	DRA170-180		9					1949
Drava III	DRA160-170		2					
Drava III	DRA150-160							
Drava III	DRA140-150		1		3			35
Drava III	DRA130-140							
Drava III	DRA120-130		2					
Drava III	DRA110-120		2					
Drava III	DRA100-110							22
Drava III	DRA090-100		2		54			200
Drava III	DRA080-090		2		74			
Drava III	DRA070-080							
Drava III	DRA060-070		7					2276
Drava III	DRA050-060		3					
Drava III	DRA040-050		1					
Drava III	DRA030-040		3					250
Drava III	DRA020-030		1					
Drava III	DRA010-020		2					
Drava III	DRA000-010		4					

DANUBE RIVER

		Actitis hypoleucos	Alcedo atthis	Charadrius dubius	Merops apiaster	Riparia riparia	Sterna albifrons	Sterna hirundo
Danube I	DAN1420-1430		1					
Danube I	DAN1410-1420		5	4				
Danube I	DAN1400-1410		5					
Danube I	DAN1390-1400		5					
Danube I	DAN1380-1390		4	3				
Danube II	DAN1370-1380		10	4				1
Danube II	DAN1360-1370		5					130
Danube II	DAN1350-1360		5		20			45
Danube II	DAN1340-1350		3		48			170
Danube II	DAN1330-1340		3		52			
Danube II	DAN1320-1330		6					80
Danube II	DAN1310-1320		7					3
Danube II	DAN1300-1310		1		13			
Danube II	DAN1295-1300		1					

		Actitis hypoleucos	Alcedo atthis	Charadrius dubius	Merops apiaster	Riparia riparia	Sterna albifrons	Sterna hirundo
MURA RIVER								
Mura I	MUR140-145	2						
Mura I	MUR130-140	1					89	
Mura I	MUR120-130	2	2					
Mura I	MUR110-120		1				46	
Mura I	MUR100-110	2	3					
Mura I	MUR090-100	2		4				
Mura I, Mura II	MUR080-090	5	2	5				4
Mura II	MUR070-080	8	3	3				12
Mura II	MUR060-070	8	6	6				
Mura II	MUR050-060	15	6	25				47
Mura II	MUR040-050	15	8	9	14			193
Mura II	MUR030-040	3	4	1				80
Mura II	MUR020-030	7	4	4				150
Mura II	MUR010-020	4	2	2				25
Mura II	MUR000-010	3	7	3				233



Linear density analysis

per 10 river KM (no. pairs in table/10)

necessarily to maintain a favourable condition/size of the population

absence of species data on sections → various causes

we can envisage suitable locations for performing renaturations

		Actitis hypoleucos	Alcedo atthis	Charadrius dubius	Merops apiaster	Riparia riparia	Sternula albifrons	Sterna hirundo
MURA RIVER								
Mura River	MUR140-145	2						
Mura River	MUR130-140	1				89		
Mura River	MUR120-130	2	2					
Mura River	MUR110-120		1			46		
Mura River	MUR100-110	2	3					
Mura River	MUR090-100	2		4				
Mura River	MUR080-090	5	2	5	6			
Mura River	MUR070-080	8	3	3				
Mura River	MUR060-070	8	6	6				
Mura River	MUR050-060	15	6	25	25			
Mura River	MUR040-050	15	8	9				
Mura River	MUR030-040	3	4	1				
Mura River	MUR020-030	7	4	4	9			
Mura River	MUR010-020	4	2	2				
Mura River	MUR000-010	3	7	3		233		
DRAVA RIVER								
Drava River	DRA310-315	1						
Drava River	DRA295-290	1	3	1		160		
Drava River	DRA250-260		1	1				
Drava River	DRA240-250	2	5	6	14	131		
Drava River	DRA230-240	1	5		6	950		
Drava River	DRA220-230	1	7	2	28	419		
Drava River	DRA210-220		4	1	45	275		
Drava River	DRA200-210		2	3		8		
Drava River	DRA190-200	1	3	4				
Drava River	DRA180-190	1	5	3	85	1310		
Drava River	DRA170-180		9			1949		
Drava River	DRA160-170		2					
Drava River	DRA150-160							
Drava River	DRA140-150		1		3	35		
Drava River	DRA130-140							
Drava River	DRA120-130		2					
Drava River	DRA110-120		2					
Drava River	DRA100-110		2			22		
Drava River	DRA090-100		2		54	200		
Drava River	DRA080-090		2		74			
Drava River	DRA070-080						2270	
Drava River	DRA060-070		7					
Drava River	DRA050-060		3					
Drava River	DRA040-050		1					
Drava River	DRA030-040		3			250		
Drava River	DRA020-030		1					
Drava River	DRA010-020		2					
Drava River	DRA000-010		4					
DANUBE RIVER								
Danube River	DAN1420-1430		1					
Danube River	DAN1410-1420		5	1				
Danube River	DAN1400-1410		5					
Danube River	DAN1390-1400		5					
Danube River	DAN1380-1390		4	3				
Danube River	DAN1370-1380		10	4		130		
Danube River	DAN1360-1370		5			415		
Danube River	DAN1350-1360		5		20	43		
Danube River	DAN1340-1350		3		48	170		
Danube River	DAN1330-1340		3		52			
Danube River	DAN1320-1330		6			80		
Danube River	DAN1310-1320		7			13		
Danube River	DAN1300-1310		1		13			
Danube River	DAN1295-1300		1					

River trainings structures

gryons
riprap

TAKE INTO ACCOUNT ALSO RESULTS FROM OTHER STUDIES

Conclusions and improvements

- The estimation of population size of key bird species according to the census in lifelineMDD in 2021 is comparable to the population estimates given in the „Action plan for birds in TBR“, based on existing data between 2011-2016 (Gattermayr et al. 2019).
- Due to the high water level of the whole breeding season 2021, it is necessary to conduct a census in 2022 to get more realistic result of the population estimate of gravel and sand breeders in TBR MDD.
- Implementation of renaturation projects from a bird's eye view pays off! In 2021 in the renaturation area in Gosdorf three indicator bird species nested – sand martin, common sandpiper and kingfisher, and non-nesting little ringer plovers were also observed.

Conclusions

- The linear densities of the little ringed plover (*Charadrius dubius*) in some river sections are among the highest in Central Europe and are of particular conservation importance, while nesting in the natural habitat of this species.
- The population estimate for the kingfisher for TBR MDD is underestimated because not all of the river side arms have been surveyed.
- Analysis of the results of nesting key river bird species per 10 km river sections, together with the results of other studies (overlay map), can give very concrete proposals of locations for the implementation of restoration measures/projects.

Thank you!

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