

DANUBE RIVER BASIN MANAGEMENT PLAN

UPDATE 2021

ANNEXES 1-21

ICPDR **IKSD**

International Commission
for the Protection
of the Danube River
www.icpdr.org

Internationale Kommission
zum Schutz der Donau



COMPETENT AUTHORITIES AND WEBLINKS TO NATIONAL RBM PLANS IN THE DRBD

ANNEX 1



Austria

Federal Ministry for Agriculture, Regions and Tourism
Stubenring 1
1012 Wien
www.bmlrt.gv.at

National RBM Plan:
info.bmlrt.gv.at/themen/wasser/wisa/ngp.html

Bosnia and Herzegovina

Ministry of Foreign Trade and Economic Relations
Musala 9
71000 Sarajevo
www.mvteo.gov.ba

Federal Ministry of Agriculture, Water Management and Forestry
Hamdije Ćemerlića 2
71000 Sarajevo
www.fmpvs.gov.ba

National RBM Plan:
www.voda.ba/plan-upravljanja-2022-2027

Ministry of Agriculture, Forestry and Water Management of Republika Srpska
Trg Republike Srpske 1
78000 Banja Luka
www.vladars.net

National RBM Plan:
www.voders.org/dokumentacija

Bulgaria

Ministry of Environment and Water
22 Maria-Luisa Blvd.
1000 Sofia
www.moew.government.bg

Danube River Basin Directorate
60, Chataldzha str.
5800 Pleven
www.bd-dunav.org

National RBM Plan:
www.bd-dunav.org/content/upravlenie-na-vodite/plan-za-upravlenie-na-rechniia-baseyn/purb-2022-2027-v-dunavski-rayon/
www.moew.government.bg/bg/vodi/planove-za-upravlenie/planove-za-upravlenie-na-

rechnite-basejni-purb/planove-za-upravlenie-na-rechnite-basejni-2022-2027-g

Croatia

Ministry of Economy and Sustainable Development
Ulica grada Vukovara 78
10000 Zagreb
mingor.gov.hr

Croatian Waters
Ulica grada Vukovara 220
10000 Zagreb
www.voda.hr

National RBM Plan:
<https://narodne-novine.nn.hr/clanci/sluzbeni/dodatni/441070.pdf> for period 2016-2021;
<https://mingor.gov.hr/o-ministarstvu-1065/djelokrug/uprava-vodnoga-gospodarstva-i-zastite-mora-2033/planski-dokumenti-upravljanja-vodama/plan-upravljanja-vodnim-podrucjima-2022-2027/5556> and
<https://www.voda.hr/hr/planska-razdoblja/plansko-razdoblje-2022-2027> for period 2022-2027

Czech Republic

Ministry of Environment
Vrsovicá 65
10010 Praha 10
www.mzp.cz

Ministry of Agriculture
Tesnov 17
110 00, Praha 1
eagri.cz

National RBM Plan:
eagri.cz/public/web/mze/voda/planovani-v-oblasti-vod/

Germany

Bavarian State Ministry for Environment and Consumer Protection
Rosenkavalierplatz 2
81925 München
www.stmuv.bayern.de

Ministry for the Environment, Climate Protection and the Energy Sector Baden-Württemberg

Kernerplatz 10
70182 Stuttgart
um.baden-wuerttemberg.de

National RBM Plan:
<https://www.fgg-donau.bayern.de/wrrl/bewirtschaftungsplaene/index.htm>

Hungary

Ministry of Interior
Jozsef Attila u. 2-4
1051 Budapest
www.kormany.hu/hu/belugyminiszterium

National RBM Plan:
www.vizeink.hu

Republic of Moldova

Ministry of Environment
9 Cosmonautilor St.
2005 Chisinau
www.mediugov.md

Montenegro

Ministry of Agriculture, Forestry and Water
Management
Rimski Trg 46
81000 Podgorica
www.gov.me/mpsv

Water Administration
Bulevar Revolucije 24
81000 Podgorica
upravazavode.gov.me/uprava

National RBM Plan:
<https://www.gov.me/mpsv>

Romania

Ministry of Environment, Waters and Forests
12 Libertatii Blvd., Sector 5
04129 Bucharest
www.mmediu.ro

National Administration "Apele Romane"
6 Edgar Quinet St., Sector 1
010018 Bucharest
rowater.ro

National RBM Plan:

<https://rowater.ro/consultarea-publicului/directiva-cadru-apa/materiale-utile/>

Serbia

Ministry of Agriculture, Forestry and Water
Management
Nemanjina 22-26
11000 Beograd
www.minpolj.gov.rs/?script=lat

Republic Directorate for Water
Bulevar umetnosti 2a
11070 Beograd
www.rdvode.gov.rs/lat

Slovakia

Ministry of the Environment
„Námestie Ľ. Štúra 1”
81235 Bratislava
www.minzp.sk
www.vuvh.sk/rsv2

National RBM Plan:
<https://www.minzp.sk/voda/vodny-plan-slovenska/>

Slovenia

Ministry of the Environment and Spatial
Planning
Dunajska 48
1000 Ljubljana
www.mop.gov.si

National RBM Plan:
<https://www.gov.si teme/nacrt-upravljanja-voda-na-vodnih-obmocjih/>

Ukraine

Ministry for Environmental Protection and
Natural Resources
35, Mitropolita Vasylia Lypkivskogo Str.
03035 Kyiv

State Agency for Water Management
8, Velyka Vasylykivska Str.
01601 Kyiv
www.menr.gov.ua

National RBM Plan:
<https://buvrtysa.gov.ua/newsite/>

DRBD SURFACE WATER TYPOLOGY

ANNEX 2



Typology of the Danube River

The typology of the Danube River has been developed in a joint activity by the countries sharing the Danube River for the first DBA in 2004. The Danube typology therefore constitutes a harmonised system used by all these countries. The Danube typology was based on a combination of abiotic factors of System A and System B. The most important factors are ecoregion, mean water slope, substratum composition, geomorphology and water temperature.

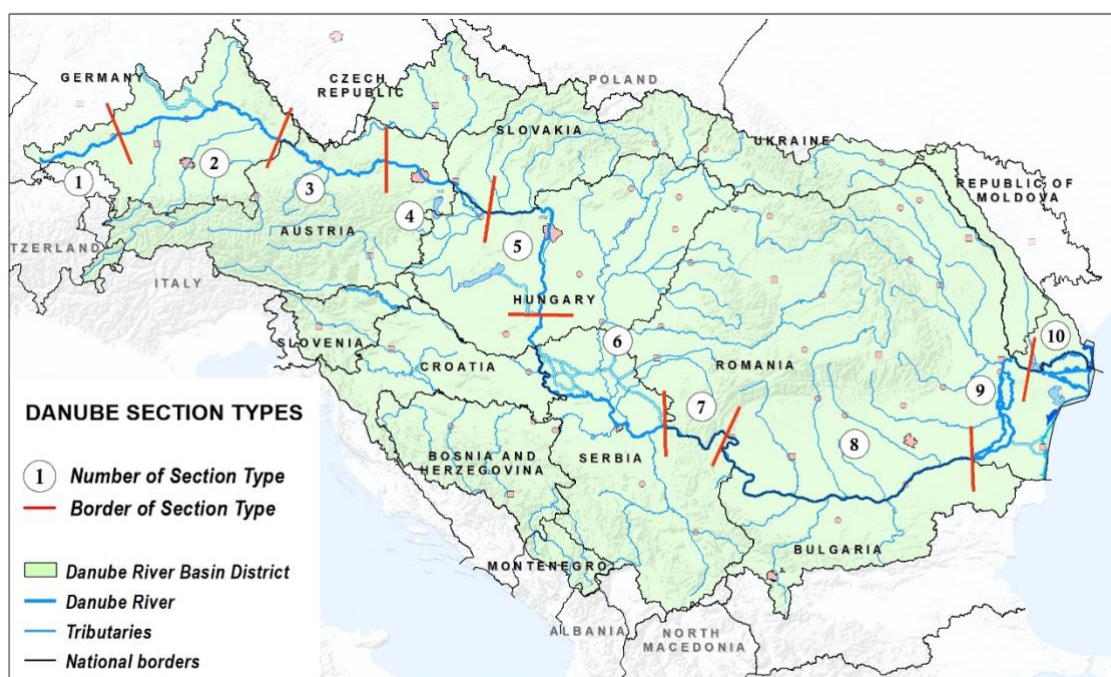


Figure 1: Danube section types; the dividing lines refer only to the Danube River itself.

Table 1: Danube section types

Section Type	Name of the Section Type	from - to
1	Upper course of the Danube	rkm 2786: confluence of Brigach and Breg – rkm 2581: Neu Ulm
2	Western Alpine Foothills Danube	rkm 2581: Neu Ulm – rkm 2225: Passau
3	Eastern Alpine Foothills Danube	rkm 2225: Passau – rkm 2001: Krems
4	Lower Alpine Foothills Danube	rkm 2001: Krems – rkm 1790: Gönyű/Klišská Nemá
5	Hungarian Danube Bend	rkm 1790: Gönyű/ Kližská Nemá – rkm 1497: Baja
6	Pannonian Plain Danube	rkm 1497: Baja – rkm 1075 : Bazias
7	Iron Gate (Cazane) Danube	rkm 1075: Bazias – rkm 943: Turnu Severin
8	Western Pontic (Cazane-Calarasi) Danube	rkm 943: Turnu Severin – rkm 375.5: Chiciu/Silistra
9	Eastern Wallachian (Calarasi-Isacceca) Danube	rkm 375.5: Chiciu/Silistra – rkm 100: Isacceca
10	Danube Delta*	rkm 100: Isacceca – rkm 0 on Chilia arm, rkm 0 on Sulina arm and rkm 0 on Sf. Gheorghe arm

Ten Danube section types were identified (see Figure 1 and Table 1). The morphological and habitat characteristics are outlined for each section type. In order to ensure that the Danube section types are biologically meaningful, these were validated with biological data collected during the first Joint Danube Survey in 2001.

Typology of the tributaries in the Danube River Basin District

The typologies of the Danube tributaries were developed by the countries individually. Stream types relevant on transboundary water courses were bilaterally harmonised with the neighbours.

Most countries in the DRB (Germany, Austria, Czech Republic, Hungary, Slovenia, Bosnia and Herzegovina, Serbia, Croatia, Romania, Bulgaria) have applied System B (Annex II, 1.2.1 WFD) for establishing their river typology. Only Slovakia and Ukraine have used System A. Countries using System B have used a number of optional factors to further describe the river types. River discharge, mean substratum composition and mean water slope are most frequently used.

Table 2 gives an overview of the class boundaries used by the DRB countries for the common descriptors: altitude, catchment area and geology.

Table 2: Obligatory factors used in river typologies (Systems A and B)

Descriptor	Country	Class boundaries						
Altitude	Germany	0-200 m	200-800m		> 800 m			
	Austria	0-200 m	200-500 m	500-800 m	800-1600 m	> 1600 m		
	Czech Republic	0-200 m	200-500 m	500-800 m		> 800 m		
	Slovakia	0-200 m	200-500 m	500-800 m		> 800 m		
	Hungary ¹	slope categories were used in river typology						
	Croatia	0-200 m	200 - 500 m		> 500 m			
	Slovenia	no altitude classes were used in river typology						
	Serbia	0-200 m	200-500 m	> 500 m				
	Romania	0-200 m	200-500 m	> 500 m				
	Bulgaria	0-200 m	200-800 m		> 800 m			
	Bosnia and Herzegovina	< 200 m	200-500 m	500-800 m		> 800 m		
	Republic of Moldova	0-200 m	200-800m		> 800 m			
	Montenegro							
Ukraine	< 200 m	200-500 m		500-800 m				
Catchment area	Germany	10-100 km ²	100-1000 km ²		1000-10,000 km ²		> 10,000 km ²	
	Austria	10-100 km ²	100-500 km ²	500-1000 km ²	1000-2500 km ²		2500-10,000 km ²	
	Czech Republic	Not applied anymore						
	Slovakia ²	10-100 km ²		100 – 1 000 km ²		1000 – 10000 km ²		
	Hungary	10-100 km ²	100-1000 km ²	1000-10,000 km ²	10,000-100,000 km ²		> 100,000 km ²	
	Croatia	10-100 km ²		100-1000 km ²		1000-10,000 km ²		> 10,000 km ²
	Slovenia	<10 km ²	10-100 km ²	100-1000 km ²	1000-10,000 km ²		> 10,000 km ²	
	Serbia	10-100 km ²	100-1000 km ²		1000-4000 km ²	4000-10,000 km ²	> 10,000 km ²	
	Romania	10-100 km ²	100-1000 km ²		1000-10,000 km ²		> 10,000 km ²	
	Bulgaria	10-100 km ²	100-1300 km ²		1300-10,000 km ²		> 10,000 km ²	
	Bosnia and Herzegovina	<100 km ²	100-1000 km ²		1000-4000 km ²	4000-10,000 km ²	> 10,000 km ²	
	Republic of Moldova	10-100 km ²	100-1000 km ²		1000-10,000 km ²		> 10,000 km ²	
	Montenegro							
Ukraine	10-100 km ²	100-1000 km ²		1000-10,000 km ²		> 10,000 km ²		
Geology	Germany	siliceous		calcareous		organic		
	Austria	crystalline	tertiary and quaternary sediments		flysch and helveticum	limestone and dolomite		
	Czech Republic	crystalline and vulcanites			sandstones, mudstones and quaternary			
	Slovakia	mixed						
	Hungary	siliceous			calcareous			
	Croatia	siliceous		calcareous		organic	mixed	
	Slovenia	siliceous		calcareous		flysch ³		
	Serbia	siliceous		calcareous		organic		
	Romania	siliceous		calcareous		organic		
	Bulgaria	siliceous		calcareous		mixed		
Bosnia and Herzegovina	siliceous		calcareous		organic			

¹ River type-classification of waterbodies based on the slope category more powerful than altitude based on biological validation results (slope categories: <0,15 ‰, 0,15 ‰ - 2,5‰, >2,5‰; real altitude categories are rather 0-150m, 150-350m, >350 m and used as background-information).

² The river typology is not based on strict boundaries of catchment area. Rivers > 1,000 km² make up individual types; definition of types for smaller rivers is based on ecoregion, altitude and geology.

³ not for the tributaries in the Danube river basin district

	Republic of Moldova	siliceous	calcareous	organic
	Montenegro			
	Ukraine	siliceous	calcareous	organic

Lakes

Types for four lakes were reported at the DRB overview level: Neusiedler/Fertő-to (Austria/Hungary), Balaton (Hungary), Ialpug (Ukraine) and Razim/Razelm (Romania). Information is provided in Table 3.

Table 3: Lakes selected for the basin-wide overview and their types

Lakes > 100 km ²	Country(s)	Type of lake	Ecoregion	Altitude class	Depth class	Size class	Geology
Neusiedler See / Fertő-tó	AT, HU	lowland, large shallow, saline lake	2	lowland: < 200 m	< 3 m	> 100 km ²	saline
Lake Balaton	HU	lowland, very large, mid deep, calcareous lake	1	lowland: < 200 m	3-15 m	> 100 km ²	calcareous
Ozero Ialpug	UA	n.a.	12	n.a.	n.a.	> 100 km ²	n.a.
Lacul Razim / Razelm	RO	lowland, very shallow, calcareous, very large lake type	12	lowland: < 200 m	< 3 m	> 100 km ²	calcareous

Transitional and coastal waters

The transitional and coastal waters of the DRB are located in Romania and Ukraine. For the development of the typology of transitional and coastal waters System B was applied. The transitional waters are differentiated into lacustrine and marine transitional waters (Table 4).

Table 4: Types of transitional waters in the DRBD

Transitional water	Type
Lake Sinoe	Transitional lacustrine type
Black Sea coastal waters (northern sector) – Chilia mouth to Periboina	Transitional marine type

Two coastal water types have been defined for the coastal waters in the DRBD (Table 5).

Table 5: Types of coastal waters in the Danube River Basin District

Coastal water	Type
Periboina – Singol Cape	Sandy shallow coastal water
Singol Cape – Vama veche	Mixed shallow coastal water

URBAN WASTEWATER EMISSION INVENTORY

ANNEX 3



Urban wastewater discharge data were collected from the countries in line with the reporting requirements of the UWWTD (non-EU countries used the same template). The data served the assessments of the point source organic substance and nutrient emissions via urban wastewater discharges for the reference year 2018. Summarizing tables of the data submitted are presented in the followings.

Table 1: Number of agglomerations according to collection and treatment systems (dominant technological level) and countries

Collection and treatment system	DE	AT	CZ	SK	HU	SI	HR	BA	ME	RS	BG	RO	MD	UA	Basin
NP-removal	460	528	133	143	405	92	9	0	1	3	34	163	0	0	1,971
P-removal	76	0	19	60	12	0	0	0	0	0	1	1	0	0	169
N-removal	9	73	19	3	8	0	0	0	0	0	0	2	0	0	114
Secondary treatment	108	3	24	46	96	35	15	3	2	23	9	125	2	11	502
Primary treatment	0	0	0	2	28	0	7	0	0	2	0	9	3	2	53
Collected but not treated	0	0	0	3	0	4	27	25	1	94	18	39	2	15	228
Addressed through IAS	0	0	6	87	65	6	56	0	0	0	19	13	0	0	252
Addressed through local systems	0	0	0	0	0	0	0	108	0	213	0	0	0	0	321
Not collected	0	0	0	1	1	1	22	33	3	7	42	1,497	137	282	2,026
Total	653	604	201	345	615	138	136	169	7	342	123	1,849	144	310	5,636

Table 2: Summed Population Equivalents (PE) according to collection and treatment systems of the agglomerations (dominant technological level) and countries

Collection and treatment system	DE	AT	CZ	SK	HU	SI	HR	BA	ME	RS	BG	RO	MD	UA	Basin
NP-removal	11,693,316	13,549,068	2,143,176	3,165,720	10,117,479	849,708	405,156	0	32,000	193,836	2,517,870	11,617,809	0	0	56,285,138
P-removal	274,643	0	69,792	207,130	371,334	0	0	0	0	0	19,924	13,496	0	0	956,319
N-removal	40,124	286,792	234,671	68,020	41,444	0	0	0	0	0	0	41,052	0	0	712,103
Secondary treatment	370,946	5,499	126,575	200,590	2,403,988	427,329	1,338,200	385,500	12,400	647,809	329,410	1,393,149	20,800	615,848	8,278,043
Primary treatment	0	0	0	7,210	373,231	0	153,140	0	0	45,641	0	419,482	45,900	31,291	1,075,895
Collected but not treated	0	0	0	17,520	0	16,739	523,966	723,784	10,100	4,142,979	122,698	237,644	20,300	127,970	5,943,700
Addressed through IAS	0	0	45,332	331,840	302,079	16,063	282,396	0	0	0	108,005	75,204	0	0	1,160,919
Addressed through local systems	0	0	0	0	0	0	0	778,121	0	1,013,710	0	0	0	0	1,791,831
Not collected	0	0	0	3,600	48,307	3,507	105,379	682,821	89,400	52,955	150,128	6,175,603	495,279	1,154,537	8,961,516
Total	12,379,029	13,841,359	2,619,546	4,001,630	13,657,862	1,313,346	2,808,237	2,570,226	143,900	6,096,930	3,248,035	19,973,439	582,279	1,929,646	85,165,464

Table 3: Summed Population Equivalents (PE) according to collection types and countries

Collection type	DE	AT	CZ	SK	HU	SI	HR	BA	ME	RS	BG	RO	MD	UA	Basin
Collected by sewer	12,365,946	13,754,871	2,464,455	3,451,348	11,648,962	1,203,004	1,987,107	981,528	83,382	4,283,162	2,864,871	12,438,567	81,976	648,924	68,258,102
Collected by IAS	13,083	86,488	155,091	529,408	1,457,217	97,977	557,685	0	0	0	217,253	372,860	0	0	3,487,062
Collected by local systems	0	0	0	0	0	0	0	1,063,387	0	1,674,254	0	0	12,893	0	2,750,534
Not collected	0	0	0	20,874	551,683	12,365	263,445	525,311	60,518	139,514	165,911	7,162,012	487,410	1,280,722	10,669,765
Total	12,379,029	13,841,359	2,619,546	4,001,630	13,657,862	1,313,346	2,808,237	2,570,226	143,900	6,096,930	3,248,035	19,973,439	582,279	1,929,646	85,165,464

Table 4: Number of centralized treatment facilities according to treatment types and countries

Centralized treatment type	DE	AT	CZ	SK	HU	SI	HR	BA	ME	RS	BG	RO	MD	UA	Basin
NP-removal	460	528	116	93	422	56	11	0	2	3	31	165	0	0	1,887
P-removal	9	73	19	4	32	0	0	0	0	0	0	5	0	0	142
N-removal	76	0	19	78	13	0	0	0	0	0	1	4	0	0	191
Secondary treatment	108	3	26	79	99	36	26	11	2	34	10	435	7	12	888
Primary treatment	0	0	0	2	33	0	9	1	0	9	3	35	6	2	100
Collected but not treated	0	0	0	12	0	11	98	73	3	283	87	143	20	21	751
Total	653	604	180	268	599	103	144	85	7	329	132	787	33	35	3,959

Table 5: Summed Population Equivalents (PE) connected to centralized systems according to treatment types and countries

Centralized treatment type	DE	AT	CZ	SK	HU	SI	HR	BA	ME	RS	BG	RO	MD	UA	Basin
NP-removal	11,680,565	13,463,297	2,052,729	2,987,006	8,899,229	797,711	279,824	0	46,720	136,157	2,349,878	10,016,325	0	0	52,709,443
P-removal	40,118	286,086	225,277	70,589	87,990	0	0	0	0	0	0	29,421	0	0	739,481
N-removal	274,343	0	63,691	173,525	349,930	0	0	0	0	0	18,529	16,063	0	0	896,082
Secondary treatment	370,920	5,488	122,757	184,438	1,982,913	388,470	1,085,013	339,040	9,160	554,213	319,311	1,331,622	34,547	536,949	7,264,840
Primary treatment	0	0	0	4,857	328,900	0	109,694	4,797	0	44,817	5,103	602,597	31,050	23,521	1,155,336
Collected but not treated	0	0	0	30,933	0	16,823	512,575	637,691	27,502	3,547,975	172,050	442,538	16,379	88,454	5,492,920
Total	12,365,946	13,754,871	2,464,455	3,451,348	11,648,962	1,203,004	1,987,107	981,528	83,382	4,283,162	2,864,871	12,438,567	81,976	648,924	68,258,102

Table 6: Biochemical Oxygen Demand (BOD) discharges of centralized systems according to treatment types and countries (t/year)

Centralized treatment type	DE	AT	CZ	SK	HU	SI	HR	BA	ME	RS	BG	RO	MD	UA	Basin
NP-removal	3,351.0	4,118.5	494.2	1,169.5	4,939.4	464.3	288.0	0.0	762.1	256.2	2,834.9	26,489.3	0.0	0.0	45,167.4
P-removal	27.6	129.4	39.6	59.3	132.2	0.0	0.0	0.0	0.0	0.0	0.0	34.8	0.0	0.0	422.9
N-removal	108.5	0.0	24.0	142.4	90.4	0.0	0.0	0.0	0.0	0.0	21.4	23.3	0.0	0.0	409.9
Secondary treatment	248.9	6.4	33.7	393.9	1,535.3	447.4	6,965.9	5,994.8	45.1	3,693.4	748.7	4,398.8	446.9	1,065.1	26,024.3
Primary treatment	0.0	0.0	0.0	18.3	265.9	0.0	1,869.0	105.1	0.0	597.9	112.9	3,983.9	796.8	300.5	8,050.3
Collected but not treated	0.0	0.0	0.0	176.7	0.0	368.3	10,834.9	14,047.4	166.6	63,763.0	6,285.5	8,483.0	443.4	1,597.4	106,166.3
Total	3,736.0	4,254.3	591.5	1,960.2	6,963.1	1,280.0	19,957.8	20,147.3	973.8	68,310.5	10,003.3	43,413.0	1,687.1	2,963.0	186,241.1

Table 7: Chemical Oxygen Demand (COD) discharges of centralized systems according to treatment types and countries (t/year)

Centralized treatment type	DE	AT	CZ	SK	HU	SI	HR	BA	ME	RS	BG	RO	MD	UA	Basin
NP-removal	24,197.0	28,925.9	3,710.5	6,009.5	17,435.9	2,759.5	1,583.8	0.0	1,524.2	469.6	10,394.7	67,381.6	0.0	0.0	164,392.3
P-removal	144.6	576.3	333.3	259.6	449.6	0.0	0.0	0.0	0.0	0.0	0.0	133.0	0.0	0.0	1,896.4
N-removal	603.7	0.0	155.8	513.0	535.7	0.0	0.0	0.0	0.0	0.0	78.4	78.1	0.0	0.0	1,964.6
Secondary treatment	1,232.3	20.0	183.3	3,664.7	4,601.1	1,755.8	10,676.2	10,990.5	82.0	6,694.0	2,745.1	10,213.2	633.1	3,644.4	57,135.6
Primary treatment	0.0	0.0	0.0	59.9	914.4	0.0	3,212.3	192.7	0.0	1,096.2	207.0	11,376.7	1,289.1	510.8	18,859.2
Collected but not treated	0.0	0.0	0.0	365.2	0.0	767.4	19,864.1	25,753.6	333.1	116,898.8	11,590.0	20,299.3	732.1	2,715.6	199,319.1
Total	26,177.5	29,522.1	4,382.9	10,871.8	23,936.8	5,282.7	35,336.4	36,936.8	1,939.4	125,158.7	25,015.1	109,481.9	2,654.2	6,870.9	443,567.1

Table 8: Total Nitrogen (TN) discharges of centralized systems according to treatment types and countries (t/year)

Centralized treatment type	DE	AT	CZ	SK	HU	SI	HR	BA	ME	RS	BG	RO	MD	UA	Basin
NP-removal	9,892.0	8,473.3	1,366.6	2,475.9	5,519.7	588.9	253.4	0.0	111.8	83.1	1,701.0	10,532.1	0.0	0.0	40,997.8
P-removal	54.6	339.3	134.7	81.1	102.6	0.0	0.0	0.0	0.0	0.0	0.0	18.6	0.0	0.0	731.0
N-removal	191.9	0.0	62.2	64.5	234.9	0.0	0.0	0.0	0.0	0.0	12.8	22.5	0.0	0.0	588.8
Secondary treatment	473.5	7.1	80.2	328.1	1,283.4	685.3	2,194.7	921.5	10.8	1,070.3	898.4	1,596.5	141.4	1,185.1	10,876.1
Primary treatment	0.0	0.0	0.0	4.6	221.3	0.0	311.8	17.5	0.0	114.7	16.9	1,693.6	134.3	56.4	2,571.2
Collected but not treated	0.0	0.0	0.0	17.8	0.0	54.0	1,589.1	2,181.7	24.4	9,351.9	948.3	2,294.6	68.2	233.2	16,763.3
Total	10,612.0	8,819.7	1,643.8	2,972.0	7,361.9	1,328.2	4,349.0	3,120.7	147.0	10,620.0	3,577.4	16,157.8	343.9	1,474.7	72,528.1

Table 9: Total Phosphorus (TP) discharges of centralized systems according to treatment types and countries (t/year)

Centralized treatment type	DE	AT	CZ	SK	HU	SI	HR	BA	ME	RS	BG	RO	MD	UA	Basin
NP-removal	582.8	550.6	97.8	184.4	601.0	82.6	39.4	0.0	22.9	7.9	141.7	1,103.1	0.0	0.0	3,414.1
P-removal	6.4	18.3	7.8	4.8	14.7	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	53.7
N-removal	50.5	0.0	13.8	15.5	36.5	0.0	0.0	0.0	0.0	0.0	7.5	2.2	0.0	0.0	126.0
Secondary treatment	72.9	1.1	9.3	36.6	554.9	124.1	628.4	202.6	2.6	254.8	131.0	243.3	48.9	205.7	2,516.1
Primary treatment	0.0	0.0	0.0	0.7	32.6	0.0	71.8	3.5	0.0	25.2	2.8	156.6	37.3	11.6	342.0
Collected but not treated	0.0	0.0	0.0	2.6	0.0	9.2	370.2	471.5	5.0	1,912.9	158.1	279.5	19.2	47.9	3,276.1
Total	712.7	570.1	128.7	244.5	1,239.6	215.9	1,109.8	677.7	30.4	2,200.7	441.1	1,786.3	105.4	265.2	9,728.1

Table 10: Summed basin-wide Population Equivalents (PE) according to collection types and future scenarios

Scenario	Sewer	IAS	Local system & Not collected
Reference	68,258,102	3,487,062	13,420,300
Baseline	75,417,050	4,624,307	5,124,107
Vision I	80,103,651	5,061,813	0
Vision II	76,599,420	8,566,044	0

Table 11: Summed basin-wide Population Equivalents (PE) connected to centralized systems according to treatment types and future scenarios

Scenario	Tertiary	Secondary	Primary	Collected but not treated
Reference	54,345,005	7,264,840	1,155,336	5,492,920
Baseline	62,618,034	9,110,206	81,666	3,607,143
Vision I	70,435,042	9,668,609	0	0
Vision II	68,874,889	7,724,531	0	0

Table 12: Summed basin-wide surface water and soil emissions according to future scenarios (t/year)

Scenario	BOD		COD		TN		TP	
	Water	Soil	Water	Soil	Water	Soil	Water	Soil
Reference	186,241	295,225	443,567	543,667	72,528	46,959	9,728	7,726
Baseline	162,850	114,030	436,199	212,377	82,664	21,911	10,121	3,351
Vision I	97,762	2,003	339,904	7,343	79,578	6,076	8,581	611
Vision II	96,531	3,515	335,389	12,887	75,336	10,990	8,125	1,124

Table 13: Relative changes of surface water emissions via urban wastewater discharges according to countries and future scenarios as compared to the reference status (%)

Country	Baseline				Vision I				Vision II			
	BOD	COD	TN	TP	BOD	COD	TN	TP	BOD	COD	TN	TP
DE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AT	0.0	0.0	-0.6	-0.2	0.0	0.0	-0.6	-0.2	0.0	0.0	-0.6	-0.2
CZ	0.0	0.0	-1.7	-0.9	0.0	0.0	-1.7	-0.9	0.0	0.0	-1.7	-0.9
SK	-8.7	-24.4	-2.5	-3.0	2.7	-19.8	-6.8	5.8	1.6	-20.5	-9.5	2.2
HU	10.8	12.9	2.6	-18.0	10.8	12.9	2.6	-18.0	10.4	12.5	1.8	-18.3
SI	-18.2	-7.3	-25.1	-38.5	-7.4	4.6	7.7	-31.5	-7.5	4.6	7.6	-31.5
HR	-80.2	-64.3	-55.5	-77.6	-80.2	-64.3	-55.5	-77.6	-80.4	-64.7	-57.2	-78.1
BA	-2.0	-1.6	-0.2	-0.9	-83.9	-67.8	-24.0	-60.1	-84.3	-68.7	-31.9	-63.5
ME	0.0	0.0	0.0	0.0	-92.2	-85.7	-54.4	-70.3	-92.6	-86.4	-62.4	-74.3
RS	-15.9	-13.8	-0.6	-5.0	-90.3	-81.8	-55.2	-73.0	-90.4	-82.0	-57.6	-74.3
BG	-48.9	-34.5	-22.6	-34.4	-48.9	-34.5	-22.6	-34.4	-49.1	-34.8	-25.0	-36.6
RO	21.4	38.8	84.1	103.6	25.2	44.2	89.9	108.0	23.4	41.7	73.3	91.5
MD	-68.0	-56.6	-17.6	-42.3	24.4	144.4	352.0	125.6	19.7	133.6	270.6	96.6
UA	9.7	11.8	14.2	12.0	-6.0	48.5	82.7	44.9	-10.4	41.5	51.2	25.9
Basin	-12.6	-1.7	14.0	4.0	-47.5	-23.4	9.7	-11.8	-48.2	-24.4	3.9	-16.5

Table 14: Relative changes of soil emissions via urban wastewater discharges according to countries and future scenarios as compared to the reference status (%)

Country	Baseline				Vision I				Vision II			
	BOD	COD	TN	TP	BOD	COD	TN	TP	BOD	COD	TN	TP
DE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CZ	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SK	-64.9	-47.9	-6.6	-10.6	-65.2	-48.4	-6.9	-10.6	-61.5	-42.9	3.5	-0.3
HU	-95.6	-91.6	-52.6	-66.4	-95.6	-91.6	-52.6	-66.4	-95.0	-90.4	-47.4	-63.4
SI	-85.5	-74.4	-16.1	-26.2	-83.1	-70.3	-3.4	-15.5	-82.5	-69.1	0.7	-11.7
HR	-96.2	-92.7	-55.6	-69.4	-96.2	-92.7	-55.6	-69.4	-95.6	-91.5	-49.8	-65.9
BA	-1.7	-1.7	-1.7	-1.7	-99.9	-99.8	-98.1	-98.9	-99.6	-99.3	-93.3	-96.3
ME	0.0	0.0	0.0	0.0	-99.9	-99.8	-97.4	-98.4	-99.6	-99.2	-91.3	-94.7
RS	0.0	0.0	0.0	0.0	-99.9	-99.7	-97.1	-98.3	-99.7	-99.4	-92.7	-95.4
BG	-97.5	-95.2	-65.1	-77.3	-97.5	-95.2	-65.1	-77.3	-96.9	-93.9	-53.1	-68.5
RO	-99.6	-99.3	-92.4	-95.4	-99.6	-99.3	-92.5	-95.5	-99.0	-98.1	-78.8	-86.9
MD	-2.4	-2.4	-2.4	-2.4	-99.7	-99.4	-92.3	-95.1	-98.9	-97.8	-74.2	-83.6
UA	-6.3	-6.3	-6.3	-6.3	-99.8	-99.6	-94.8	-96.7	-99.3	-98.6	-83.4	-89.4
Basin	-61.4	-60.9	-53.3	-56.6	-99.3	-98.6	-87.1	-92.1	-98.8	-97.6	-76.6	-85.5

INDUSTRIAL EMISSION INVENTORY

ANNEX 4



Industrial pollutant release data were collected from the E-PRTR database (note that some data might have been updated since November 2021) and directly from the countries which do not report under the E-PRTR system. The data served the assessments of the point source organic matter and nutrient emissions via direct industrial dischargers for the reference year 2018. Summarizing tables of the data submitted are presented in the followings.

Table 1: Number of industrial facilities with reported Chemical Oxygen Demand (COD) discharge according to industrial sectors and countries

Activity	DE	AT	CZ	SK	HU	SI	HR	BA	ME	RS	RO	BG	MD	UA	Basin
Energy sector	0	0	0	1	4	0	0	0	0	0	3	0	0	0	8
Production and processing of metals	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2
Mineral industry	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Chemical industry	2	2	0	2	2	0	0	0	0	0	2	0	0	0	10
Waste and industrial wastewater management	0	4	0	1	3	0	0	0	0	0	0	0	0	0	8
Paper and wood production processing	5	4	0	2	1	2	0	0	0	0	0	1	0	1	16
Intensive livestock production and aquaculture	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
Products from the food and beverage sector	0	1	0	0	2	0	0	0	0	1	0	0	0	0	4
Other activities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	7	11	0	7	14	2	0	0	0	1	5	3	0	1	51

Table 2: Chemical Oxygen Demand (COD) discharges according to industrial sectors and countries (t/year)

Activity	DE	AT	CZ	SK	HU	SI	HR	BA	ME	RS	RO	BG	MD	UA	Basin
Energy sector	0	0	0	806	3,417	0	0	0	0	0	919	0	0	0	5,141
Production and processing of metals	0	0	0	371	1,176	0	0	0	0	0	0	0	0	0	1,547
Mineral industry	0	0	0	0	210	0	0	0	0	0	0	0	0	0	210
Chemical industry	1,236	898	0	445	669	0	0	0	0	0	11,759	0	0	0	15,007
Waste and industrial wastewater management	0	14,342	0	185	727	0	0	0	0	0	0	0	0	0	15,253
Paper and wood production processing	7,791	9,855	0	3,598	2,208	621	0	0	0	0	0	815	0	131	25,019
Intensive livestock production and aquaculture	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
Products from the food and beverage sector	0	702	0	0	1,158	0	0	0	0	185	0	0	0	0	2,045
Other activities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	9,027	25,797	0	5,405	9,565	621	0	0	0	185	12,677	817	0	131	64,224

Table 3: Number of industrial facilities with reported Total Nitrogen (TN) discharge according to industrial sectors and countries

Activity	DE	AT	CZ	SK	HU	SI	HR	BA	ME	RS	RO	BG	MD	UA	Basin
Energy sector	1	1	0	1	3	0	0	3	0	0	0	0	0	0	9
Production and processing of metals	0	0	0	1	0	0	0	0	0	1	1	0	0	0	3
Mineral industry	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chemical industry	2	1	0	1	2	0	1	1	0	0	1	0	0	0	9
Waste and industrial wastewater management	0	1	0	1	1	0	0	0	0	0	0	0	0	0	3
Paper and wood production processing	0	1	0	1	0	0	0	0	0	0	0	0	0	1	3
Intensive livestock production and aquaculture	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3
Products from the food and beverage sector	0	1	0	0	0	0	0	2	0	1	0	0	0	0	4
Other activities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	3	5	0	5	6	0	1	6	0	2	2	3	0	1	34

Table 4: Total Nitrogen (TN) discharges according to industrial sectors and countries (t/year)

Activity	DE	AT	CZ	SK	HU	SI	HR	BA	ME	RS	RO	BG	MD	UA	Basin
Energy sector	52	72	0	142	608	0	0	7	0	0	0	0	0	0	881
Production and processing of metals	0	0	0	145	0	0	0	0	0	70	522	0	0	0	737
Mineral industry	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chemical industry	183	91	0	107	241	0	62	0	0	0	58	0	0	0	742
Waste and industrial wastewater management	0	91	0	60	83	0	0	0	0	0	0	0	0	0	234
Paper and wood production processing	0	55	0	106	0	0	0	0	0	0	0	0	0	98	259
Intensive livestock production and aquaculture	0	0	0	0	0	0	0	0	0	0	0	218	0	0	218
Products from the food and beverage sector	0	224	0	0	0	0	0	14	0	52	0	0	0	0	290
Other activities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	235	532	0	560	932	0	62	21	0	122	580	218	0	98	3,360

Table 5: Number of industrial facilities with reported Total Phosphorus (TP) discharge according to industrial sectors and countries

Activity	DE	AT	CZ	SK	HU	SI	HR	BA	ME	RS	RO	BG	MD	UA	Basin
Energy sector	0	0	0	1	2	0	0	2	0	0	1	0	0	0	6
Production and processing of metals	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Mineral industry	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chemical industry	1	0	0	0	0	0	0	0	0	1	0	0	0	0	2
Waste and industrial wastewater management	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2
Paper and wood production processing	1	1	0	1	1	0	0	0	0	0	0	1	0	1	6
Intensive livestock production and aquaculture	0	0	0	0	1	0	0	0	0	0	0	3	0	0	4
Products from the food and beverage sector	0	1	0	0	0	0	0	2	0	1	0	0	0	0	4
Other activities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2	3	0	3	5	0	0	4	0	2	1	4	0	1	25

Table 6: Total Phosphorus (TP) discharges according to industrial sectors and countries (t/year)

Activity	DE	AT	CZ	SK	HU	SI	HR	BA	ME	RS	RO	BG	MD	UA	Basin
Energy sector	0	0	0	13	16	0	0	0	0	0	10	0	0	0	38
Production and processing of metals	0	0	0	6	0	0	0	0	0	0	0	0	0	0	6
Mineral industry	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chemical industry	6	0	0	0	0	0	0	0	0	40	0	0	0	0	46
Waste and industrial wastewater management	0	26	0	0	10	0	0	0	0	0	0	0	0	0	36
Paper and wood production processing	7	15	0	17	15	0	0	0	0	0	0	5	0	9	68
Intensive livestock production and aquaculture	0	0	0	0	4	0	0	0	0	0	0	109	0	0	113
Products from the food and beverage sector	0	8	0	0	0	0	0	1	0	11	0	0	0	0	20
Other activities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	13	49	0	36	44	0	0	1	0	51	10	114	0	9	328

NUTRIENT EMISSION MODELLING WITH MONERIS

ANNEX 5



HAZARDOUS SUBSTANCES POLLUTION INVENTORY

ANNEX 6



LIST OF FUTURE INFRASTRUCTURE PROJECTS

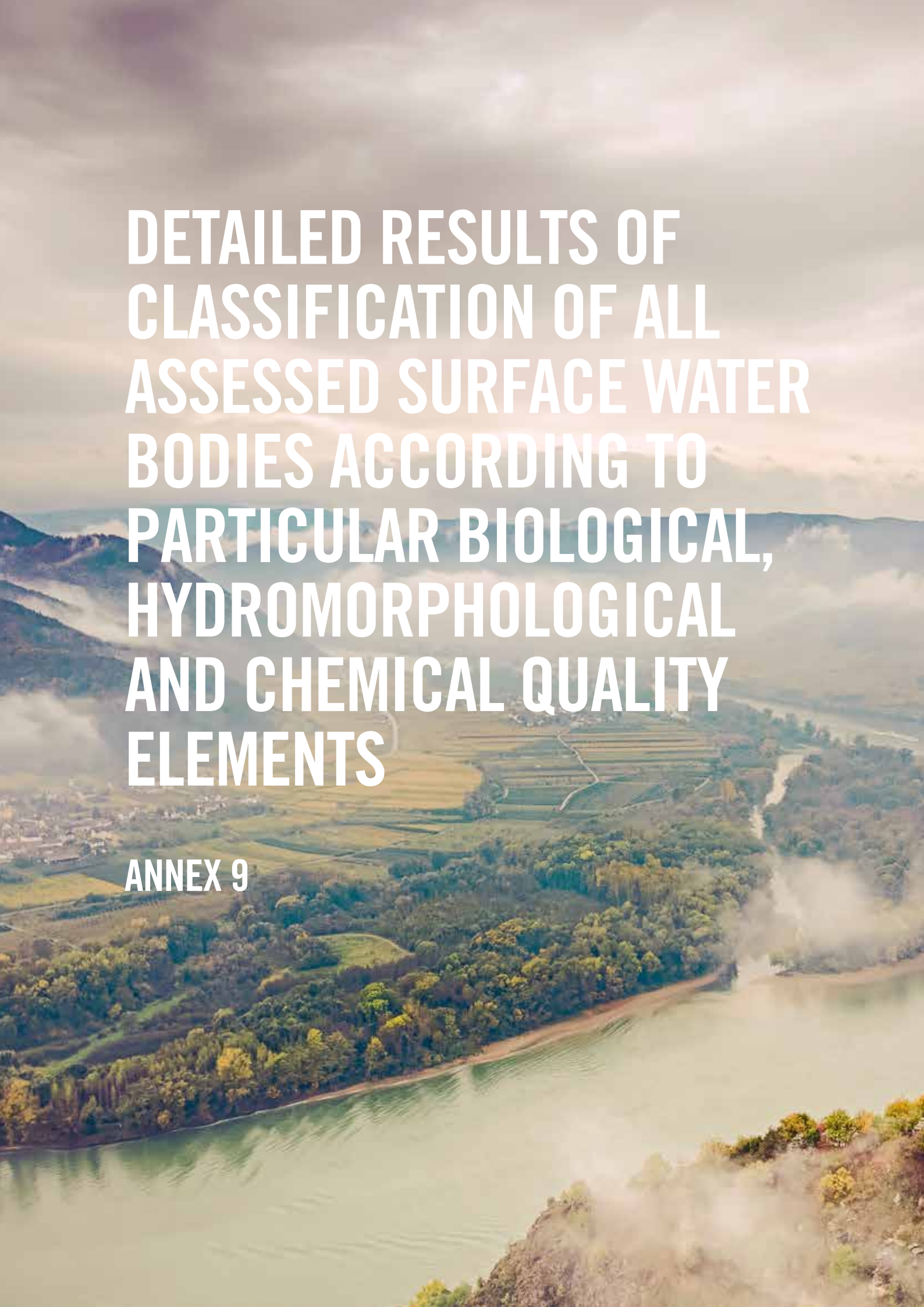
ANNEX 7



GROUNDWATER IN THE DRBD

ANNEX 8



An aerial photograph of a wide river valley. The river flows from the bottom left towards the right. The valley floor is a mix of green fields, some with distinct patterns, and dense green forests. In the distance, there are rolling hills and mountains under a sky filled with soft, grey clouds. The overall scene is a natural landscape with agricultural elements.

DETAILED RESULTS OF CLASSIFICATION OF ALL ASSESSED SURFACE WATER BODIES ACCORDING TO PARTICULAR BIOLOGICAL, HYDROMORPHOLOGICAL AND CHEMICAL QUALITY ELEMENTS

ANNEX 9

TRANSBOUNDARY SURFACE WATER BODIES

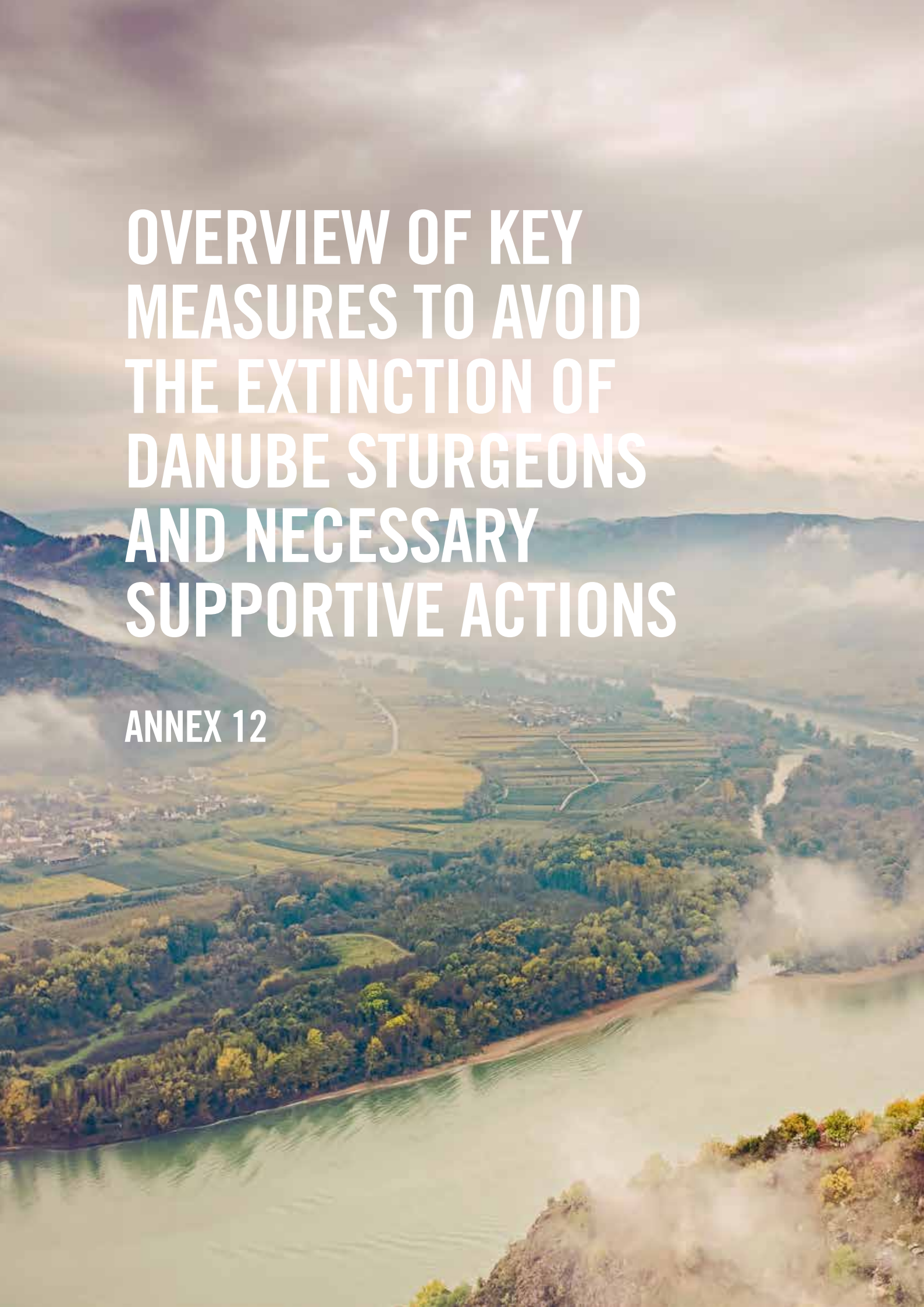
ANNEX 10



INVENTORY OF PROTECTED AREAS

ANNEX 11



An aerial photograph of a wide river valley. The river flows from the bottom right towards the center. The valley floor is a patchwork of green and yellow agricultural fields, interspersed with dense green forests. In the distance, rolling hills and mountains are visible under a heavy, overcast sky with soft light breaking through the clouds. The overall scene is a mix of natural and agricultural landscapes.

OVERVIEW OF KEY MEASURES TO AVOID THE EXTINCTION OF DANUBE STURGEONS AND NECESSARY SUPPORTIVE ACTIONS

ANNEX 12

ECONOMIC ANALYSIS

ANNEX 13



PROGRESS OF MEASURE IMPLEMENTATION IN URBAN WASTEWATER AND INDUSTRIAL SECTORS

ANNEX 14



PROGRESS OF MEASURE IMPLEMENTATION IN THE AGRICULTURAL SECTOR

ANNEX 15



PROGRESS ON MEASURES ADDRESSING HYDROMORPHOLOGICAL ALTERATIONS

ANNEX 16



An aerial photograph of a wide river valley. The river flows from the bottom right towards the center. The valley floor is a patchwork of green and yellow agricultural fields, with some small settlements visible. The surrounding hills and mountains are covered in dense green forests. The sky is filled with soft, grey clouds, and a light mist or fog hangs over the valley, particularly near the riverbanks and in the distance. The overall scene is a mix of natural and agricultural landscapes.

ECOLOGICAL PRIORITISATION APPROACH RIVER AND HABITAT CONTINUITY RESTORATION

ANNEX 17

DETAILED LIST OF HYDROLOGICAL ALTERATIONS

ANNEX 18



HYDROMORPHOLOGICAL LIGHTHOUSE PROJECTS IN THE DANUBE RIVER BASIN DISTRICT (2015-2021)

ANNEX 19



DISCONNECTED WETLANDS AND FORMER FLOODPLAINS WITH POTENTIAL FOR RECONNECTION

ANNEX 20



FINANCING JOINT PROGRAMME OF MEASURES

ANNEX 21

