Annexes

The Danube River Basin District

River basin characteristics, impact of human activities and economic analysis required under Article 5, Annex II and Annex III, and inventory of protected areas required under Article 6, Annex IV of the EU Water Framework Directive (2000/60/EC)

Part A – Basin-wide overview

Short: "Danube Basin Analysis (WFD Roof Report 2004)"

List of Annexes

ANNEX 1 List of rivers and lakes selected for the basin-wide overview of the Danube River Basin District

This annex includes all rivers with a catchment size > 4 000 km², and all lakes and lagoons with a surface area > 100 km². These are all shown on the DRBD overview map (**Map 1**).

Table 1 List of rivers selected for the basin-wide overview

Name of river	Size of river basin [km²]	Countries (from source to mouth)
Donau/Dunaj/Duna/Dunav/Dunărea	801,463	DE, CH, CZ, PL, SK, IT, AT, SI, HR, BA, CS, HU, RO, BG, AL, MK, MD, UA
Lech	4,125	AT, DE
Naab	5,530	CZ, DE
Isar	8,964	AT, DE
Inn	26,130	CH, IT, AT, DE
Salzach	6,680	AT, DE
Traun	4,257	AT
Enns	6,185	AT
Morava/March	26,658	CZ, SK, AT
Dyje/Thaya	13,190	CZ, AT
Svratka	4,117	CZ
Raab/Rába	10,113	AT, HU
Rabnitz/Rábca/Répce	4,825	AT, HU
Váh	18,296	PL, SK
Nitra	4,993	SK
Hron	5,463	SK
Ipel/Ipoly	5,108	SK, HU
Sió	9216	HU
Drau/Drava	41,238	IT, AT, SI, HR HU
Mur/Mura	14,149	AT, SI, HR, HU
Tysa/Tisza/Tisa	157,186	UA, RO, HU, SK, CS
Bega/Begej	4,458	RO, CS
Mureş/Maros	30,332	RO, HU
Târnava	6,253	RO
Körös	27,537	RO, HU
Hortobágy-Berettyó	5,771	HU
Kettős-Körös (Fekete+Fehér)	9,600	RO, HU
Crişul Alb/Fehér-Körös	4,275	RO, HU
Crişul Negru/Fekete-Körös	4,645	RO, HU
Barcău/Berettyó	5,812	RO, HU
Crişul Repede/Sebes-Körös	9,119	RO, HU
Zagyva	5,578	HU
Slaná/Sajó	12,708	SK, HU
Hornád/Hernád	5,436	SK, HU
Bodrog	13,579	UA, SK, HU
Ondava	3,973	SK
Latorica	7,680	SK, UA

Name of river	Size of river basin [km²]	Countries (from source to mouth)
Someş/Szamos	18 146	RO, HU
Someşul Mare	5,033	RO
Someşul Mic	3,773	RO
Zala	(with Balaton) 5,752	HU
Sava	95,719	HR, SI, BH, CS, AL
Drina	19,483	AL, BH, CS
Lim	5,785	AL, CS, BH
Bosna	10,457	BH
Vrbas	6,380	BH
Una	9,368	HR, BH
Kolpa/Kupa	10,236	SI, HR
Timiş/Tamiš	10,147	RO, CS
Velika Morava	37,444	MK, BG, CS
Zapadna Morava	15,680	CS
Ibar	7,925	CS
Juzna Morava	15,400	MK, BG, CS
Nišava	4,000	BG, CS
Timok	4,630	CS, BG
Jiu	10,080	RO
Ogosta	4,268	BG
Iskâr	8,684	BG
Olt	24,050	RO
Yantra	7,879	BG
Vedea	5,430	RO
Argeş	12,550	RO
Ialomiţa	10,350	RO
Seret/Siret	47,610	UA, RO
Buzău	5,246	RO
Barlad	7,220	RO
Trotuş	4,456	RO
Bistriţa	7,039	RO
Moldova	4,200	RO
Prut	27,540	UA, MD, RO
Jijia	5,757	RO
Ialpug	4,430	MD, UA

Bold font: main tributaries to the Danube River, single indent: 2nd order tributaries, double indent: 3rd order tributaries, triple indent: 4th order tributaries, quadruple indent: 5th order tributaries

Table 2 List of lakes and lagoons selected for the basin-wide overview

Lakes and lagoons	Surface area [km²]	Mean depth [m]	Countries
Neusiedler See / Fertő-tó	315	1,10	AT, HU
Balaton	605	3,60	HU
Ozero Ialpug	149	na	UA
Lacul Razim	392	2,05	RO
Lacul Sinoe (lagoon)	162	1,25	RO

ANNEX 2 Overview of river types in the Danube River Basin District

This annex gives an overview for 11 countries of the Danube River Basin District.

Country	Code	Name of river type
Germany	DE_Typ 1	watercourses of the Alps
	DE_Typ 2	watercourses of the Alpine foothills
	DE_Typ 3	watercourses of the young moraines of the Alpine foothills
	DE_Typ 4	large watercourses of the Alpine foothills
	DE_Typ 5	siliceous brooks of the highlands dominated by coarse sediments
	DE_Typ 5.1	siliceous brooks of the highlands dominated by fine sediments
	DE_Typ 6	calcareous brooks of the highlands dominated by fine sediments
	DE_Typ 7	calcareous brooks of the highlands dominated by coarse sediments
	DE_Typ 9	siliceous streams of the highlands dominated by fine to coarse sediments
	DE_Typ 9.1	calcareous streams of the highlands dominated by fine to coarse sediments
	DE_Typ 9.2	large streams of the highlands
	DE_Typ 10	pebble-dominated rivers
	DE_Typ 11	organic brooks
	DE_Typ 12	organic streams
	DE_Typ 21	watercourses characterised by lake outflow
Austria	AT_ST_Large Rivers_Danube_Type d-1,75	River Danube, Saprobiological Basic Condition = 1,75
	AT_ST_Large Rivers_Danube_Type e-2,00	River Danube, Saprobiological Basic Condition = 2,00
	AT_ST_Large Rivers_Thaya_Type d-1,75	River Thaya Saprobiological Basic Condition = 1,75
	AT_ST_Large Rivers_Thaya_Type e-2,00	River Thaya Saprobiological Basic Condition = 2,00
	AT_ST_Large Rivers_Morava_Type e-2,00	River Morava Saprobiological Basic Condition = 2,00
	AT_ ST_Large Rivers_Alpine River_Type c-1,50	Alpine Rivers (Mur, Drau, Salzach, Inn), Saprobiological Basic Condition = 1,50
	AT_ ST_Large Rivers_Alpine River_Type d-1,75	Alpine Rivers (Mur, Drau, Salzach, Inn), Saprobiological Basic Condition = 1,75
	AT_UZA_Type b-1,25	Non-glaciated Crystalline Alps, Saprobiological Basic Condition = 1,25
	AT_UZA_Type c-1,50	Non-glaciated Crystalline Alps, Saprobiological Basic Condition = 1,50
	AT_UZA_Type d-1,75	Non-glaciated Crystalline Alps, Saprobiological Basic Condition = 1,75
	AT_BR_Type c-1,50	Ridges and Foothills of the Crystalline Alps, Saprobiological Basic Condition = 1,50
	AT_BR_type d-1,75	Ridges and Foothills of the Crystalline Alps, Saprobiological Basic Condition = 1,75
	AT_KV_Type d-1,75	Limestone Foothills, Saprobiological Basic Condition = 1,75
	AT_KH_Type b-1,25	Limestone Alps, Saprobiological Basic Condition = 1,25
	AT_KH_Type c-1,50	Limestone Alps, Saprobiological Basic Condition = 1,50
	AT_AV_Type d-1,75	Bavarian Austrian Piedmont, Saprobiological Basic Condition = 1,75
	AT_FH_Type d-1,75	Eastern Ridges and Lowlands, Saprobiological Basic Condition = 1,50
	AT_GG_Type c-1,50	Granite and Gneiss Region of Bohemian Massif, Saprobiological Basic Condition = 1,50
	AT_GG_Type d-1,75	Granite and Gneiss Region of Bohemian Massif, Saprobiological Basic Condition = 1,75

Country	Code	Name of river type
Czech Republic	CZ=Typ 1	small, siliceous, Carpaticum, lowland streams
	CZ=Typ 2	greater, siliceous, Carpaticum, lowland streams
	CZ=Typ 3	great, siliceous, Carpaticum, lowland streams
	CZ=Typ 4	small, calcareous, Carpaticum, lowland streams
	CZ=Typ 5	greater, calcareous, Carpaticum, lowland streams
	CZ=Typ 6	small, siliceous, Carpaticum, foothill streams
	CZ=Typ 7	small, siliceous, Carpaticum, foothill streams
	CZ=Typ 8	small, calcareous, Carpaticum, foothill streams
	CZ=Typ 9	greater, siliceous, Carpaticum, foothill streams
	CZ=Typ 10	small, siliceous, Panonicum, lowland streams
	CZ=Typ 11	greatest, siliceous, Panonicum, lowland streams
	CZ=Typ 12	greater, siliceous, Panonicum, lowland streams
	CZ=Typ 13	great, siliceous, Panonicum, lowland streams
	CZ=Typ 14	small, calcareous, Panonicum, lowland streams
	CZ=Typ 15	greater, calcareous, Panonicum, lowland streams
	CZ=Typ 16	great, calcareous, Panonicum, lowland streams
	CZ=Typ 17	small, siliceous, Panonicum, foothill streams
	CZ=Typ 18	small, calcareous, Panonicum, foothill streams
	CZ=Typ 24	small, siliceous, Hercynium, lowland stream
	CZ=Typ26	greater, siliceous, Hercynium, lowland stream
	CZ=Typ 27	great, siliceous, Hercynium, lowland streams
	CZ=Typ 32	small, siliceous, Hercynium, foothill streams
	CZ=Typ 34	greater, siliceous, Hercynium, foothill streams
	CZ=Typ 35	great siliceous, Hercynium, foothill streams
	CZ=Typ 36	small, calcareous, Hercynium, foothill streams
	CZ=Typ 37	greater, calcareous, Hercynium, foothill streams
Hungary	HU-Typ 1	small siliceous mountainous stream dominated by coarse sediments
	HU-Typ 2	small calcareous mountainous stream dominated by coarse sediments
	HU-Typ 3	medium calcareous mountainous stream dominated by coarse sediments
	HU-Typ 4	small calcareous hilly stream dominated by coarse sediments
	HU-Typ 5	medium calcareous hilly stream dominated by coarse sediments
	HU-Typ 6	large calcareous hilly stream dominated by coarse sediments
	HU-Typ 7	very large calcareous hilly stream dominated by coarse sediments
	HU-Typ 8	small calcareous hilly brook dominated by medium-fine sediments
	HU-Typ 9	medium calcerous hilly stream dominated by medium-fine sediments
	HU-Typ 10	large calcareous hilly stream dominated by medium-fine sediments
	HU- Typ 11	small calcareous lowland stream dominated by coarse sediments
	HU-Typ 12	medium calcareous lowland stream dominated by coarse sediments
	HU-Typ 13	large calcareous lowland stream dominated by coarse sediments
	HU-Typ 14	very large calcareous lowland stream dominated by coarse sediments
	HU-Typ 15	small calcareous lowland brook dominated by medium-fine sediments
	HU- Typ 16	small with low slope calcerous lowland stream dominated by medium-fine sediments
	HU- Typ 17	medium with low slope calcerous lowland stream dominated by medium-fine sediments
	HU-Typ 18	medium calcareous lowland stream dominated by medium-fine sediments
	HU-Typ 19	large calcareous lowland streams dominated by medium-fine sediments
	HU-Typ 20	very large calcareous lowland stream dominated by medium-fine sediments
	HU-Typ 21	small organic lowland brook
	HU-Typ 22	medium organic lowland stream
	HU-Typ 23	Danube upstream from Gönyü
	HU-Typ 24	Danube between Gönyü and Baja
	HU-Typ 25	Danube downstream from Baja

Country	Code	Name of river type
Slovakia	SK_Typ1	Lowland rivers located in the Danubian area of Carpathian region with predominant siliceous rocks.
	SK_Typ2	Mid-altitude rivers located in the Danubian area of Carpathian region with predominant siliceous rocks.
	SK_Typ3	High-altitude rivers located in the Danubian area of Carpathian region with predominant siliceous rocks.
	SK_Typ4	Mid-altitude rivers located in the Danubian area of Carpathian region with predominant calcareous rocks.
	SK_Typ5	Mid-altitude rivers located in the Danubian area of Carpathian region with predominant siliceous rocks of neovolcanics.
	SK_Typ6	High-altitude rivers located in the Danubian area of Carpathian region with predominant siliceous rocks of neovolcanics.
	SK_Typ7	Mid-altitude rivers located in the Upper Vah area, in the Carpathian region, with predominant siliceous rocks.
	SK_Typ8	High-altitude rivers located in the Upper Vah area, in the Carpathian region, predominant are siliceous rocks.
	SK_Typ9	Rivers located in the Upper Vah area in Carpathian region, with predominant siliceous rocks and altitude above 1500 m.
	SK_Typ10	High-altitude rivers located in the Upper Vah area in the Carpathian region, with predominant calcareous rocks.
	SK_Typ11	Rivers located in the Danubian area of Hungarian lowlands with predominant siliceous rocks.
	SK_Typ12	Rivers located in the Danubian area of Hungarian lowlands, with predominant siliceous rocks and altitude 200-500m.
	SK_Typ17	Mid-altitude rivers located in the Slana section of Carpathian ecoregion with predominant siliceous rocks.
	SK_Typ18	High-altitude rivers located in the Slana section of Carpathian ecoregion with predominant siliceous rocks.
	SK_Typ19	Mid-altitude rivers located in the Slana section in Carpathian ecoregion with predominant calcareous rocks.
	SK_Typ20	Mid-altitude rivers located in the Slana section in Carpathian ecoregion with predominant siliceous rocks of neovolcanics.
	SK_Typ21	Mid-altitude rivers located in the Latorica section in Carpathian ecoregion, with predominant siliceous rocks.
	SK_Typ22	Mid-altitude rivers located in the Latorica section in Carpathian ecoregion, with predominant siliceous rocks of neovolcanics.
	SK_Typ23	Rivers located in the Latorica section in Hungarian lowlands with predominant siliceous rocks.
	SK_Section Type 1	Lower Alpine Foothills Danube
	SK_Section Type 2	Hungarian Danube Bend
	SK_M1	Lower part of Morava River
	SK_V1	Upper part of Vah River; Orava and Turiec rivers
	SK_V2	Middle part of Vah River
	SK_V3	Lower part of Vah and Nitra rivers
	SK_H1	Lower part of Hornad River
	SK_I1	Lower part of Ipel River
	SK_R1	Middle part of Hron River
	SK_R2	Lower part of Hron River
	SK_S1	Lower part of Slana River
	SK_B1	Middle part of Ondava, Topla and Laborec rivers
	SK_B2	Slovak part of Latorica and Bodrog rivers; lower part of Ondava, Topla and Laborec rivers
Slovenia	SI_Typ A1	small alpine & hilly river
	SI_Typ A2	small to medium alpine & hilly intermittent river
	SI_Typ A3	small to medium alpine & hilly river
	SI-Typ D1	medium Dinaric & hilly river
	SI-Typ H1	large Pannonian & hilly siliceous river
	SI-Typ H2	large Pannonian & lowland siliceous river
	SI-Typ H3	medium Pannonian & hilly river
	SI-Typ H4	medium Pannonian & lowland river
	SI-Typ H5	large Pannonian & lowland river

Country	Code	Name of river type
Croatia	HR_Section Type 6	Pannonian Plain Danube
	HR_Type 1	Metapotamal river part (low concentration of $CaCO_3$)
	HR_Type 2	Epipotamal part of river (low concentration of $CaCO_3$)
	HR_Type 3	Undefined potamal river part*
	HR_Type 4	Lower metapotamal river part (medium concentration of $CaCO_3$)
	HR_Type 5	Upper metapotamal river part (medium concentration of $CaCO_3$)
	HR_Type 6	Epipotamal river part (medium concentration of $CaCO_3$)
	HR_Type 7	Metapotamal river part (higher concentration of $CaCO_3$)
	HR_Type 8	Undefined potamal river part (very high concentration of $CaCO_3$)
	HR_Type 9	Hyporhitral river part
	HR_Type 10	Karst river
	HR_Type 11	Crenal stream
Romania	RO_01	Mountain stream - Ecoregion 10
	RO_02	Stream in piedmont or high plateau area -Ecoregion 10
	RO_03	Stream sector in piedmont or high plateau area--*Thymallus thymallus*-grayling, *Chondrostoma nasu*s-nase - Ecoregion 10
	RO_03 *	Stream sector in piedmont or high plateau area-*Romanichys valsanicola*-endemic species - Ecoregion 10
	RO_04	Stream sector in hilly or plateau area - Ecoregion 10
	RO_05	Stream sectors in intramountain depression - Ecoregion 10
	RO_06	Stream sector with wetlands in hilly or plateau area - Ecoregion 10
	RO_07	Stream in hilly or plateau area -Sub-Ecoregion 10
	RO_08	Stream sector in hilly or plateau area –Sub-Ecoregion 10
	RO_09	Stream in hilly or plateau area - Ecoregion 11
	RO_10	Stream in plain area - Ecoregion 11
	RO_11	Stream sector in plain area (1000 - 3000 km^2) - Ecoregion 11
	RO_12	Stream sector in plain area (> 3000 km^2) - Ecoregion11
	RO_13	Stream sector with wetlands in plain area- Ecoregion 11
	RO_14	Stream in hilly or plateau area - Ecoregion 12
	RO_15	Stream in plain area - Ecoregion 12
	RO_16	Stream sector in plain area (1000 - 5000km^2) - Ecoregion 12
	RO_17	Stream sector in plain area (> 5000 km^2)- Ecoregion 12
	RO_18	Stream sector with wetlands in plain area - Ecoregion 12
	RO_19/Section type 6	The Danube river –Iron Gate Danube - Ecoregion 12
	RO_20/Section type 7	The Danube river – Romanian Plain Danube - Ecoregion 12
	RO_21/Section type 8	The Danube river –Eastern Wallachian Danube - Ecoregion 12
	RO_22/Section type 9	The Danube river - The Danube Delta - Ecoregion 12
	RO_23	Stream in hilly or plateau area - Ecoregion 16
	RO_24	Stream in plain area - Ecoregion 16
	RO_25	Stream sector with wetlands in plain area (1000 – 5000 km^2) - Ecoregion16
	RO_26	Stream sector in plain area - Ecoregion 16
	RO_27	Stream sector with wetlands in plain area (> 5000 km^2) - Ecoregion 16
	RO_28	Stream influenced from qualitative point of view by natural causes
	RO_29	Temporary stream in mountain area
	RO_30	Temporary stream in piedmont or high plateau area
	RO_31	Temporary stream in hilly and plateau area
	RO_32	Temporary stream in plain area

Country	Code	Name of river type
Serbia and Montenegro	CS_Typ1.1	Very large rivers, lowland, siliceous, fine sediments
	CS_Typ1.2	Very large rivers, lowland, siliceous, medium sediments
	CS_Typ1.3	Very large rivers, hilly, siliceous, medium sediments
	CS_Typ1.4	Large, lowland, siliceous, medium sediments
	CS_Typ1.5	Large, hilly, calcareous, medium sediments
	CS_Typ1.6	Large, hilly, siliceous, medium sediments
	CS_Typ1.7	Large, mid-altitude, siliceous, medium sediments
	CS_Typ1.8	Large, high-altitude, siliceous, medium sediments
	CS_Typ2	Medium rivers, lowland, siliceous, fine sediments
	CS_Typ3	Medium rivers, lowland, siliceous, coarse sediments
	CS_Typ4	Small rivers and streams, lowland, siliceous, fine sediments
	CS_Typ5	Small rivers and streams, lowland, siliceous, coarse sediments
	CS_Typ6	Streams, lowland, organic, silt
	CS_Typ7	Small rivers and streams, hilly, siliceous, fine sediments
	CS_Typ8	Small rivers and streams, hilly, siliceous, coarse sediments
	CS_Typ9	Small rivers and streams, hilly, calcareous, fine sediments
	CS_Typ10	Small rivers and streams, hilly, calcareous, coarse sediments
	CS_Typ11	Small rivers and streams, mid-altitude, siliceous, coarse sediments
	CS_Typ12	Small rivers and streams, mid-altitude, calcareous, coarse sediments
	CS_Typ13	Small rivers, high-altitude, siliceous, coarse sediments
	CS_Typ14	Streams, high-altitude, siliceous, coarse sediments
	CS_Typ15	Small rivers, high-altitude, calcareous, coarse sediments
	CS_Typ16	Streams, high-altitude, calcareous, coarse sediments
	CS_Typ17	Streams, high-altitude, organic, silt and sand
Bulgaria	BG-TypR1	small, foothill, siliceous, Ecoregion-12
	BG-TypR2	small, foothill, siliceous, Ecoregion -7
	BG-TypR3	small, mountain, siliceous, Ecoregion -7
	BG-TypR4	middle, plain, siliceous, Ecoregion -12
	BG-TypR5	middle, plain, calcareous, Ecoregion -12
	BG-TypR6	middle, foothill, siliceous, Ecoregion -12
	BG-TypR7	middle, foothill, siliceous, Ecoregion -7
	BG-TypR8	middle, foothill, calcareous, Ecoregion -12
	BG-TypR9	middle, foothill, calcareous, Ecoregion -7
	BG-TypR10	middle, foothill, organic, Ecoregion -7
	BG-TypR11	middle, mountain, siliceous, Ecoregion -7
	BG-TypR12	middle, mountain, calcareous, Ecoregion -7
	BG-TypR13	large, plain, siliceous, Ecoregion -12
	BG-TypR14	large, plain, calcareous, Ecoregion -12
	BG-TypR15	large, foothill, siliceous, Ecoregion -12
	BG-TypR16	large, foothill, siliceous, Ecoregion -7
	BG-TypR17	large, foothill, calcareous, Ecoregion -12
	BG-TypR18	large, foothill, calcareous, Ecoregion -7
	BG-TypR19	large, foothill, organic Ecoregion -7
	BG-TypR20	large, foothill, siliceous, Ecoregion -7
	BG-TypR21	large, foothill, calcareous, Ecoregion -7
	BG-TypR22	very large, plain, siliceous, Ecoregion -12
	BG-TypR23	middle, mountain, organic, Ecoregion -7
Moldova	RO_26/MD_02	stream sector in plain area
	RO_27/MD_03	stream sector with wetlands in plain area
	RO_18/MD_06	stream sector with wetlands in plain area

ANNEX 3 Typology of the Danube River and its reference conditions

1. **Brief characterisation of the abiotic characteristics of the Danube section types**

Section Type 1: Upper course of the Danube
(rkm 2786: confluence of Brigach and Breg – rkm 2581: Neu Ulm)
Canyon reaches alternate with plain floodplain sections dominating at the right. Channel form is sinuous to meandering and braided. The slope varies between 0.75 ‰ and 1.38 ‰.
The main channel substrates are composed of bedrock, head-sized boulders with a variable percentage of cobble, gravel and sand. In the floodplain section (with more than 300 m width) riffle and pool sections vary moderately. The bank structure is abort and sliding.
Due to the karst landscape the highly dynamic discharge regime is characterised by water exfiltration at section Immendingen to Möhringen and sporadically until Fridingen (MNQ 3 m^3/s; MQ 7-8 m^3/s; MHQ approx. 20 m^3/s). In case of total exfiltration the loss of water is substituted by tributaries and springs.
The hydrological regime is characterised by a high water level in February and March and a low water level between August and September.
The river shows a high percentage of eupotamon with primarily lotic side arms on the right side of the floodplain section.

Section Type 2: Western Alpine Foothills Danube
(rkm 2581: Neu Ulm – rkm 2225: Passau)
In this section the Danube shows an anabranching channel form (more than 65 percent) interspersed with a meandering morphology. Trough valley reaches alternate with meandering valley sections. A highly dynamic breadth erosion causes varying widths of the channels and shallow water depths. Gorge sections are at Steppberg (km 2486 - 2478) and the Weltenburger Enge (km 2422 - 2414).
The channel substrates are dominated by cobbles, gravel or sand. Sporadically a mixture of sand and gravel is present.
The slope varies between 1.1 ‰ at Ulm and 0.3 ‰ at Regensburg.
The river shows a high percentage of eupotamon. The anabranching reaches are characterised by numerous side channels providing predominantly lotic habitats. Due to highly dynamic channel routing the in-channel islands are naturally unvegetated or covered by annuals.
The floodplain vegetation consists of alluvial softwood and hardwood forests and wetlands (mires and swamps).

Section Type 3: Eastern Alpine Foothills Danube
(rkm 2225: Passau – rkm 2001: Krems)
This section type is composed of two main parts: the breakthrough section "Oberes Donautal" (km 2225 - 2160) and the anabranching stretch "Austrian Machland region" (km 2094 - 2084).
The breakthrough section is characterised by a steep, narrow incised meander valley that confines the lateral development of the river channel. Bedrocks interspersed with gravel are the dominant channel substrates.
Four short river reaches with chutes formed by outcropping bedrocks (Kachlets) are present. Such reaches feature high flow velocities and complex flow patterns. Gravel areas which fall dry in times of extreme low water amount to 5 ha per km.
The average slope value for this section is 0.43 ‰.
The channel system of the Machland stretch is branched by several islands and gravel bars. This reach can be designated as a gravel-dominated, laterally active anabranching section. The sinuosity of the main channel is 1.32, its mean width amounted to 550 m at low flow and 730 m at summer mean water, and mean depth could reach 3.8 m along the thalweg.
Danube discharge is mainly influenced by alpine flow conditions and peaks in spring/summer due to the snowmelt in the Alps. Shallow-water zones with gentle bed gradients are a formative element. This enables a high diversity of depths, flow velocities and substrate conditions, resulting in a broad spectrum of micro- and meso-habitats with extensive shorelines.

The gravel banks/islands and highly outcropping rocks in the breakthrough area offer a lotic environment almost throughout the whole reach. Most tributaries discharge into the Danube River at locations with large gravel bars and therefore provide valuable spawning habitats for rheophilic fish species. The backwaters offer interesting refuge habitats during floods and special lentic habitats for stagnophilic species.
In the anabranching stretch the river-floodplain system is characterised by eupotamon water bodies (main channel and side arms) to a very high extend, offering a primarily lotic environment (97 percent of the overall water surface area at low flow). Para-, plesio- and palaeopotamon water bodies are less frequent in relation to eupotamon ones. They represent a great variety of distinct lentic habitats and contribute to the high extend of aquatic/terrestrial interfaces. The various floodplain elements are in constant modification and renewal due to the strong erosion/sedimentation processes.

Section Type 4: Lower Alpine Foothills Danube

(rkm 2001: Krems – rkm 1789.5: Gönyű / Kližská Nemá)
The section type represents the beginning of lowland reaches with meandering, anabranching and braided channels exceptive two small breakthrough valleys at the Vienna Gate (km 1949 - 1935) and Devin Gate (km 1880). Anabranching reaches are situated in the Vienna Basin and the Danube Lowland downstream Bratislava. Here, the Danube forms an inland delta with three main river branches of braided or anastomosing-meandering character: the Great Danube branch (middle), Malý (Little/Lesser) Danube (north, km 1869 - 1768), Mosoni Danube (south, up to Gönyü km 1791). These branches form a large accumulation zone composed by the Danubian islands: Large Danube Island **"**Zitný ostrov" (on the north side) and Little Danube Island **"**Szigetköz" (on the south side). Low current velocities and high groundwater levels generate a large wetland area. Some of the branches are only active during floods. The slope value decreases from 0.35 ‰ to 0.10 ‰ at Gönyü.
The dominant main channel substrates are represented by large cobbles and gravel in the breakthrough sections, and medium to coarse gravel layered by sands and loam in the accumulation zone of the Danube Lowland. The gravel bed near Bratislava is characterised by rapid rates of lateral erosion and an extensive area of point bars and gravel bars. These bars are partially covered by incipient and older woodlands.
The active floodplain varies between 10 km upstream and downstream Vienna to 6 km upstream Váh. The floodplain area of the inland delta (Schütt/Ostrov) amounts to more than 20,000 ha and is covered by one of the largest floodplain forests in central and south-eastern Europe. It represents the habitat of numerous macrophyte communities, humid willow-poplar forests, ash-elm stands and drier elm-oak formations.
The breakthrough reaches show primarily lotic environments composed of gravel banks and islands. Backwater sections form lentic habitats during floods for stagnophilic species.
In the anabranching reaches former braided segments that became disconnected from the main channel, and old meanders or similar forms resulting from another morphological type without direct connection to the main channel are frequent.

Section Type 5: Hungarian Danube Bend

(rkm 1789.5: Gönyű / Kližská Nemá – rkm 1497: Baja)
In this section the Danube passes breakthrough sections (the Danube bend) and lowland areas (Hungarian plain), and changes its watercourse from eastward to southward. In the lowland area the Danube flows in a plain floodplain valley and shows high anabranching (mainly cut-off loops) intensity (35 to 65 percent) or meandering (>1.26 sinuosity degree).
The dominant main channel substrate consists of gravel in different sizes (from coarse gravel to fine and medium sized gravel), frequently interspersed with sand and hand sized cobbles, organic sludge, mud, silt and clay in small percentages. In the breakthrough section coarse blocks with variable percentages of cobble and sand are present.
The average slope value varies between 0.10 ‰ at Gönyü and 0.17 ‰ to 0.07 ‰ in the Hungarian bend.
The average width of the main channel amounts to 350 m; the mean depth is 4 to 5 m. The main channel shows moderate breadth erosion. This section is characterised by a mean current velocity of 0.5 m/s.

After passing the breakthrough section (Danube bend) the Danube forms two important isles: Szentendre (km 1692 - 1657) and Csepel (km 1642 - 1586).
The bank structure is variable with multiple sliding banks, isolated fallen trees, wood collections and spur banks.
The floodplain is between 300 m (upstream Budapest) and 1500 m (downstream Budapest) wide. Lotic side arms and dead arms, cut off channels and oxbow lakes, temporary side arms and standing water bodies fed by the tributaries are present in the floodplain.
The floodplain vegetation is represented by a dominant alluvial softwood forest. Isolated alluvial hardwood forests and mixed native forests are also present.
The dominant aquatic habitat in this section is the eupotamon which has a mean width of 500 m. Less than 10 percent parapotamon, plesiopotamon and palaeopotamon types are present. The percent area of terrestrial habitats (e.g. banks, islands) makes up approx. 10 percent of the entire eupotamon.
Biotic microhabitats are frequently formed by living parts of terrestrial plants and tree trunks, rarely accompanied by macrophytes, submerged plants, CPOM, FPOM and debris.

Section Type 6: Pannonian Plain Danube
(rkm 1497 : Baja – rkm 1075 : Bazias)
The Danube in this section is passing through a floodplain landscape with areas of accumulation, having a meandering and plain floodplain valley with an anabranching channel (mainly cut-off loops) and meandering sections (degree of sinuosity: 1.06 – 1.25 and partially more than 2).
A moderate breadth erosion is present in the main channel (average width: approx. 750 m, mean depth: 6 m). The main channel substrates are dominated by sand, and frequently fine to medium-sized gravel occurs. Mud, sludge, silt, loam, and clay are rare. The average slope value remains 0.04 ‰, varying between Baja and Drava from 0.07 ‰ to 0.05 ‰.
Wood and fallen trees are frequently present on the river bank, the structure is partially sliding.
The large floodplain (max. width: 30 km) is characterised by a diversity of water bodies close to the stream: lotic side arms and dead arms, cut off channels, oxbow lakes and standing water bodies fed by the tributaries. Alluvial hardwood and softwood forests are dominant. Mixed native forests represent the frequent vegetation types in the floodplain. The vegetation in few sections is sporadically composed by meadow, wetland (mire) and reeds.
In the lower reach of this Danube-section (Croatia/Serbia and Montenegro) the largest tributaries (Tisza and Sava) substantially increase the catchment area and changes the alpine runoff character of the Danube.
The average current velocity in this section is 0.4 m/s.
The dominant aquatic habitat in this section is the eupotamon, frequently accompanied by para- and palaeopotamon. The percent area of terrestrial habitats (e.g. banks, islands) represents approx. 20 percent of the entire eupotamon.
The biotic microhabitats are frequently represented by debris, CPOM, FPOM and sludge. Less than 30 percent submerged plants, filamentous algae, macrophytes, living parts of terrestrial plants as well as dead wood (tree trunks) are present.

Section Type 7: Iron Gate Danube
(rkm 1075: Bazias – rkm 943: Turnu Severin)
Djerdap/Iron Gates canyon is composed of four canyons (necks) and three extensions.
The braided channel is mostly rocky and shows areas with deposits of medium and small particles of alluvial materials (banks and islands). The main channel has an average width of about 750 m and runs in a canyon or trough valley form. Its mean depth amounts to approx. 5.5 m. Slope values range from 0.04 ‰ to above 0.25 ‰.
The dominant main channel substrates are represented by large cobbles, boulders and bedrocks (numerous rocks are situated directly under the water surface), and frequent coarse, medium and partial fine gravel interspersed with sand and mud in the slow-flowing parts.
The river bank is isolated abort and sliding, and fallen trees and wood collections are frequently present. The breadth erosion is moderate. Spur banks are present. The section is characterised by high current velocity (1.8 up to 5 m/s) and by longitudinal erosion. Shallow-water zones with gentle bed gradients are dominant. This enables a high diversity of depth, flow velocity and substrate condition.

The flooded area is reduced to an average width of about 150 m. Temporarily flooded areas (mostly to the outflow of the Nera tributary) are present in the floodplain as well as deciduous native forest along with the hardwood alluvial forest and meadow.
The potamon offers a primarily lotic environment. The area of terrestrial habitats represents only 10 percent of the entire eupotamon area. Living parts of terrestrial plants, FPOM and debris are rare.

Section Type 8: Western Pontic Danube
(rkm 943: Turnu Severin – rkm 375.5: Chiciu/Silistra)
The Danube is passing a floodplain landscape with higher plains of terraced accumulation in a meander and plain floodplain valley. The right bank is high and steep, the left bank is low and terraced with wide floodplains.
The channel is partially braided with bars and islands and partially anabranching (mainly cut-off loops). Meandering reaches are also present (degree of sinuosity 1.06-1.25). The main channel has moderate breadth erosion (average width of 830 m and mean depth of 8.5 m). Main channel substrates frequently vary from fine and medium gravel to sand accompanied by small percentages of coarse gravel and mud. The average slope values remains 0.04 ‰.
Multiple wood collections and isolated fallen trees are present on the river banks. Their structure varies: abort and sliding banks are present as well as bank spurs and nest banks. This section is characterised by moderate values of current velocity (1.30 m/s).
The average width of the floodplain is about 8000 m and the diversity of water bodies in this area close to the stream is large: lotic side arms connected to the main channel at both ends, cut off channels, oxbow lakes and standing water bodies fed by the tributaries.
Deciduous native forest, wetlands (mire) and open grass is the dominant vegetation in the floodplain, often accompanied by alluvial soft wood forest, meadow and reeds. Sporadically the vegetation is missing.
Average width of the eupotamon is 1500 m. The area of terrestrial habitats represents 75 % of the entire eupotamon.
The biotic microhabitats are frequently represented by filamentous algae and macrophytes as well as CPOM and debris. In less than 30 percent living parts of terrestrial plants and FPOM are present.

Section Type 9: Eastern Wallachian Danube
(rkm 375.5: Chiciu/Silistra – rkm 100: Isaccea)
The Danube changes its watercourse northward forming a wetland area with two large isles (374-248 km Balta Ialomita and 238-169 km Balta Braila) and many natural lakes. The valley form is a meander and plain floodplain valley with a braided channel (mostly long and narrow islands), composite anabranching channel and meandering sections (>1.26 of sinuosity degree).
The main channel has an average width of 650 m, a mean depth of 10.5 m and shows moderate breadth erosion. The dominant channel substrate is sand, frequently interspersed with mud, organic sludge, silt, loam and clay. In small percentages gravel is present in fine to medium size.
The bank structure is variable with multiple abort and nesting banks and bank spurs. Fallen trees and sliding banks are sporadically present.
The floodplain has an average width of 5500 m. Lotic side arms and dead arms, cut off channels and oxbow lakes, temporary side arms and standing water bodies fed by the tributaries form the water bodies in the floodplain. The average slope value remains 0.04 ‰. The section is characterised by slow current velocity (0.8 m/s).
More then 60 percent of the floodplain vegetation is represented by deciduous native forest, wetland (mire) and open grass frequently accompanied by alluvial softwood forest, meadows and reeds. Isolated mixed native forest and naturally unvegetated areas are present.
Eupotamon is the dominant aquatic habitat type and shows an average width of 1000 m. The percent area of terrestrial habitats amounts to 60 percent of the entire eupotamon. Parapotamon, plesiopotamon and the palaeopotamon types are frequently present.
The FPOM is the dominant biotic microhabitat in this section, frequently accompanied by macrophytes, living parts of terrestrial plants, CPOM and debris. Tree trunks, branches and roots are rarely present.

Section Type 10: Danube Delta

(rkm 100: Isaccea – rkm 20 on Chilia arm, rkm 19 on Sulina arm and rkm 7 on Sf. Gheorghe arm)

The Danube Delta is Danube's "youngest" territory having three main water channels: Chilia/Kilia, Sulina and Sf. Gheorghe, and numerous canals and floating islands ("plauri"). Close to the estuary the three main branches are divided into numerous branches creating their own delta. At mean water levels 60 percent of this area is covered by waters (90 percent at high levels). The shape of the delta is triangular. A large variety of distinct lentic habitats is developed.

The valley form is plain floodplain and the channel form is diverse due to the complexity of the delta: braided channel (braiding intensity 65 percent); split, sinuous and composite anabranching; meandering channel (degree of sinuosity >1.26). The average width of the main channels is 450 m at Chilia/Kilia, 400 m at Sulina and 450 m at Sf. Gheorghe. The mean depth of the three branches amounts to 13 m. Slope values vary between 0.04 ‰ and 0.001 ‰.

The dominant substrates are sand, mud, sludge, silt, loam and clay.

Multiple wood collections are present on the river bank; fallen trees are sporadic. At several reaches the bank structure is abort. Lotic side arms and dead arms, cut off channels and oxbow lakes, temporary side arms and standing water bodies fed by the tributaries constitute water bodies in the floodplain. The average width of the floodplain is about 100 km.

This section is characterised by a medium current velocity of 0.7 m/s (Chilia/Kilia 0.7 m/s, Sulina 0.65 m/s, Sf. Gheorghe 0.68 m/s). Accumulations of sediment produce progression of the delta which is permanently shaped by maritime currents.

The vegetation in this area is very complex, wetlands (mire) and reeds are dominant. Alluvial hardwood forest, deciduous native forest and open grass land are frequently present. Alluvial softwood forest, mixed native forest, meadow and naturally unvegetated areas are rare.

The percent area of terrestrial habitats represents 40 percent of the entire eupotamon. Para-, plesio- and palaeopotamon show equal shares.

Living parts of terrestrial plants, FPOM and debris as biotic microhabitats are rare.

2. Reference conditions of the Danube River (biological elements)

The reference conditions of the Danube River have been defined in a very first draft. These will need to be further developed and validated with other biological data.

The macroinvertebrate reference communities for the individual section types have mainly been compiled from data on existing "reference" sites and from literature sources. Results of the Joint Danube Survey (JDS, LITERÁTHY 2002) have been used, not regarding data on impounded sections. In this survey more than 100 sampling sites have been investigated. As additional historical information the huge taxa list for the whole Danube compiled by DUDICH (1967) has been used which goes back beyond 1920. Many of the major hydromorphological alterations (dams, hydropower plants etc.) have been established later than DUDICH's review.

The information given here provides a first overview of macroinvertebrate reference data.

The JDS data have been analysed by checking the presence/absence and abundances of species to identify these taxa which are mainly occurring in certain sections.

Four groups of species have been distinguished:

- section type-specific species, occurring predominantly in a certain section type, e. g. the Danube Delta (example: the Venus mussel *Chamelea gallina*)
- reach specific species, occurring predominantly in a certain region, e. g. Upper Danube River (example: the snail *Ancylus fluviatilis*)
- Danube-specific species, predominantly restricted to the Danube (e. g. pontic fauna elements like the snail *Theodoxus danubialis*)
- large river-specific species, occurring predominantly in large rivers, e. g. river Rhine (example: the caddisfly *Hydropsyche contubernalis*).

To get a first impression of the macroinvertebrate fauna of a certain section type not only the 'section type-specific species' should be considered. Additionally, the taxa of the 'reach specific species', the 'Danube specific species', and the 'large river specific species' may occur.

The results of the analysis are presented in table 1.

Table 1: Preliminary list of macroinvertebrate "reference species" for the section types and reaches of the Danube river. Species selected from data of the Joint Danube Survey (2001) and from literature (DUDICH 1967, KUSEL-FETZMANN et al. 1998, RUSSEV et al. 1998). Large river type-specific species after SCHÖLL & HAYBACH (2001).

	Section type 1	**Section type 2**	**Section type 3**	**Section type 4**	**Section type 5**	**Section type 6**	**Section type 7**	**Section type 8**	**Section type 9**	**Section type 10**
River km (from – to)	2786 - 2581	2581 - 2225	2225 - 2001	2001 - 1789.5	1789.5 - 1497	1497 - 1075	1075 - 943	943 – 375.5	375.5 - 100	100-20 Chilia arm. 100-19 Sulina arm 100-7 Sf Gheorghe a
Name of section	**Upper course of the Danube**	**Western Alpine Foothills Danube**	**Eastern Alpine Foothills Danube**	**Lower Alpine Foothills Danube**	**Hungarian Danube Bend**	**Pannonian Plain Danube**	**Iron Gate Danube**	**Western Pontic Danube**	**Eastern Wallachian Danube**	**Danube Delta**[1]
Section type-specific species	*Dendrocoelum lacteum* *Gammarus fossarum* *Baetis alpinus* *Baetis lutheri* *Caenis rivulorum* *Ecdyonurus torrentis* *Dinocras cephalotes* *Leuctra fusca* *Brychius elevatus* *Limnius volckmari* *Riolus subviolaceus* *Micropterna lateralis* *Polycentropus flavomaculatus* *Rhyacophila dorsalis* *Sericostoma flavicorne* *Silo nigicornis* *Atherix ibis*	*Dugesia lugubris* *Gammarus fossarum* *Gammarus pulex* *Gammarus roeseli* *Baetis alpinus* *Baetis fuscatus* *Ephoron virgo* *Heptagenia sulphurea* *Potamanthus luteus* *Dinocras cephalotes* *Leuctra fusca* *Aphelocheirus aestivalis* *Elmis maugetii* *Elmis rietscheli* *Hydropsyche contubernalis* *Hydropsyche exocellata* *Hydropsyche pellucidula-Gr.* *Rhyacophila dorsalis* *Tinodes pallidulus*	*Ephoron virgo* *Heptagenia coerulans* *Brachyptera trisfasciata* *Isogenus nubecula* *Xantoperla apicalis* *Ceraclea dissimilis* *C. annulicornis* *Hydropsyche contubernalis* *Oecetis notata* *Psychomyia pusilla*	*Erpobdella nigricollis* *Ecdyonurus aurantiacus* *Ephoron virgo* *Heptagenia flava* *Isogenus nubecula* *Brachyptera trisfasciata* *Xantoperla apicalis* *Agapetus laniger* *Ceraclea annulicornis* *C. dissimilis* *Hydropsyche bulgaromanorum* *Hydropsyche contubernalis* *Psychomyia pusilla*	*Ephoron virgo* *Heptagenia flava*	*Paludicella articulata*		*Isochaetides michaelseni* *Propappus volki* *Lithoglyphus naticoides* *Dreissena polymorpha* *Corophium curvispinum* *Pontogammarus obesus* *Pontogammarus sarsi* *Jaera sarsi* *Dikerogammarus haemobaphes* *Hydropsyche bulgaromanorum*	*Mytilus galloprovincialis* *Ostrea sublamellosa* *Pseudoanodonta complanata*	*Angulus exiguus* *Anodonta cygnea* *Chamelea gallina* *Mytilus galloprovincialis* *Ostrea sublamellosa* *Unio pictorum* *Gyraulus laevis* *Corophium volutator* *Hemimysis anomala* *Caenis horaria*

[1] Within this section the Danube divides into the three main branches of the Danube Delta. Each arm also has transitional waters with the following limits: Chilia arm: rkm 20 – 0, Sulina arm: km 19 – 0, Sf. Georghe arm: rkm 7 – 0.

Table 1 (continued)

	Section type 1	Section type 2	Section type 3	Section type 4	Section type 5	Section type 6	Section type 7	Section type 8	Section type 9	Section type 10
River km (from – to)	2786 - 2581	2581 - 2225	2225 - 2001	2001 - 1789.5	1789.5 - 1497	1497 - 1075	1075 - 943	943 – 375.5	375.5 - 100	100-20 Chilia arm. 100-19 Sulina arm 100-7 Sf Gheorghe a
Name of section	**Upper course of the Danube**	**Western Alpine Foothills Danube**	**Eastern Alpine Foothills Danube**	**Lower Alpine Foothills Danube**	**Hungarian Danube Bend**	**Pannonian Plain Danube**	**Iron Gate Danube**	**Western Pontic Danube**	**Eastern Wallachian Danube**	**Danube Delta**[1]
Reach specific species	**Upper Danube reach**			**Middle Danube reach**				**Lower Danube reach**		
	Ancylus fluviatilis *Baetis rhodani* *Ephemera danica* *Heptagenia sulphurea* *Calopteryx splendens*	*Brachycentrus subnubilus* *Ceraclea dissimilis* *Hydropsyche pellucidula* *Psychomyia pusilla* *Tinodes waeneri*		*Branchiura sowerbyi* *Stylaria lacustris* *Cordylophora caspia* *Esperiana esperi* *Lymnaea stagnalis* *Stagnicola palustris* *Theodoxus danubialis* *Theodoxus fluviatilis* *Limnomysis benedemi*		*Ephemera danica* *Calopteryx splendens* *Gomphus flavipes* *Ischnura elegans* *Brachycentrus subnubilus*		*Cordylophora caspia* *Dugesia tigrina* *Branchiura sowerbyi* *Stylaria lacustris* *Esperiana esperi* *Ferrissia wautieri* *Hydrobia ventrosa* *Lymnaea stagnalis* *Stagnicola palustris* *Theodoxus danubialis*	*Theodoxus fluviatilis* *Cardium edule* *Unio pictorum* *Limnomysis benedeni* *Caenis horaria* *Caenis robusta* *Gomphus flavipes* *Ischnura elegans*	
Danube - specific species	*Cordylophora caspia, Microcolpia daudebartii, Lithoglyphus naticoides, Theodoxus danubialis, Theodoxus transversalis, Viviparus acerosus, Dreissena polymorpha, Corophium curvispinum, Dikerogammarus haemobaphes, Dikerogammarus villosus, Echinogammarus ischnus, Obesogammarus obesus, Jaera istri*									
Large river-specific species	*Dina lineata, Dina punctata, Erpobdella nigricollis, Pisidium supinum, Sphaerium rivicola, Heptagenia flava, Gomphus flavipes, Gomphus vulgatissimus, Brychius elevatus, Limnius spec., Orectochilus villosus, Brachycentrus subnubilus, Ceraclea annulicornis, Ceraclea dissimilis, Hydropsyche bulgaromanorum, Hydroptila sparsa, Psychomyia pusilla*									

[1] Within this section the Danube divides into the three main branches of the Danube Delta. Each arm also has transitional waters with the following limits: Chilia arm: rkm 20 – 0, Sulina arm: km 19 – 0, Sf. Georghe arm: rkm 7 – 0.

Section type 1 (Upper course of the Danube) The macroinvertebrate fauna of this section type is characterised by lithophilous species adapted to higher stream flow velocities. The macroinvertebrate community can be regarded as 'alpine-influenced'. Typical species are the amphipod *Gammarus fossarum*, the mayflies *Baetis alpinus, B. lutheri* and *Ecdyonurus torrentis*, the stoneflies *Dinocras cephalotes* and *Leuctra fusca*, the beetles *Brychius elevatus* and *Limnius volckmari*, the caddisflies *Polycentropus flavomaculatus, Rhyacophila dorsalis* and *Sericostoma flavicorne* and the true fly *Atherix ibis*.

Section type 2 (Western Alpine Foothills Danube). Occurrence of rhithral to epipotamal species, which in part are transported into the main river from tributaries. Species composition provides in conjunction with the high habitat diversity a very diverse aquatic fauna. Grazers dominate the community, which also hosts many detritus and sediment feeders. Stone dwelling species are most abundant, few fine sediment inhabitants occur as well. Typical species are the triclad *Dugesia lugubris,* the Amphipods *Gammarus pulex* and *Gammarus roeseli*, the mayflies *Potamanthus luteus, Heptagenia sulphurea,* and *Baetis fuscatus*, the water bug *Aphelocheirus aestivalis*,the beetles *Elmis maugetii* and *E. rietscheli*, and the caddisflies *Rhyacophila nubila, Hydropsyche pellucidula* and *Tinodes pallidulus*.

Section type 3 (Eastern Alpine Foothills Danube). Also this section type is mainly influenced by prealpine features, typical species are mainly lithophilous species e. g. the mayfly *Heptagenia coerulans* which are supplemented by other species of larger rivers like the mayfly *Ephoron virgo* and a Danube-specific element, the flatworm *Dendrocoelum romanodanubiale*.

Section type 4 (Lower Alpine Foothills Danube). In this section type the morphological features change to a lowland situation. Beside the caddisfly *Psychomyia pusilla* several taxa which are not restricted to this section but live in all three sections of the upper Danube can be found, e. g. the sand-living mayfly *Ephemera danica*, the dragonfly *Calopteryx splendens* and some caddisfly species which are specific for larger rivers in general e. g. *Brachycentrus subnubilus*, *Ceraclea dissimilis* and *Tinodes waeneri*.

The **Section types 5 – 7** are difficult to differentiate in terms of macroinvertebrate community. Specific for all three sections are taxa which inhabit finer substrate types (sand, mud) and macrophytes, e. g. the aquatic earthworms (Oligochaeta) *Stylaria lacustris* and *Branchiura sowerbyi*, the snails *Esperiana (Fagotia) esperi*, *Stagnicola palustris*, *Lymnaea stagnalis, Theodoxus danubialis* and *T. fluviatilis*, the dragonflies *Gomphus flavipes* and *Calopteryx splendens* and *Ischnura elegans*. The shrimp *Limnomysis benedemi* is an important brackish element which intruded into this area from the Black Sea via the Danube Delta.

Section type-specific for **Section type 5 (Hungarian Danube Bend)** with its naturally constrained channel form and gravelly or sandy substrates are the mayfly *Heptagenia flava* and the shrimp *Dikerogammarus villosus*. In **Section type 6 (Pannonian Plain Danube)** with its finer substrates (sand, loam and clay) and macrophytes e. g. the Hydrozoan *Hydra spec*. and *Paludicella articula*, a river-specific Bryozoan, are to be found. In **Section type 7 (Iron Gate Danube)** with coarse blocks and gravels in the breakthrough itself most lowland and large species rivers which are usually to be found upstream and downstream of this section are lacking (most leeches, snails, shrimps, dragonflies). There are no specific taxa which are restricted to this section type.

With **Section type 8 (Western Pontic Danube)** the Danube flows through the Romanian plain. This section is completely located in ecoregion 12 (Pontic Province). Only a few species are characteristic for this section, additionally a lot of species which are characteristic for the lower reach of the Danube in general are to be found, e.g. the flatworm *Dugesia tigrina*, the mussel *Unio pictorum*, the mayflies *Caenis robusta* and *C. horaria* and the snails *Theodoxus danubialis* and *Ferrissia wautieri*. With *Cardium edule, Cordylophora caspia* and *Hydrobia ventrosa* mussels from the Black Sea are intruding into these sections types.

In **<u>Section type 9</u> (Eastern Wallachian Danube)** the river is divided into several channels forming extended wetland areas, the dominant substrates are sand or finer substrates. Additional species for this section are the mussels *Pseudanodonta complanata, Mytilus galloprovincalis* and *Ostrea sublamellosa,* which can also be found in Section type 10.

<u>Section type 10</u> (Danube Delta) represents the Danube Delta where the Danube is divided into 3 major arms, the dominant substrates are of a very fine grain size (clay, loam). The share of brackish species invading from the Black Sea increases, beside the species mentioned above there are several species which seem to be restricted to this section type like the mussels *Chamelea gallina, Donax trunculus*, and *Angulus exiguus*, and the shrimps *Hemismysis anomala* and *Corophium volutator*. Typical insect species are the dragonflies *Gomphus flavipes* and *Ischnura elegans* and mayflies *Caenis horaria* and *C. robusta*. *C. robusta* is tolerant against higher salinity and is to be found in Delta areas in general (e. g. the Delta of the Odra on the Baltic Sea).

Danube-specific taxa: Beside the species mentioned above which are more or less specific for certain section types or certain reaches of the Danube (Upper-, Middle-, Lower Danube) there are several macroinvertebrate species which are to looked at as "Danube-specific". They have their main distribution area within the Danube river (some of them are restricted to the Danube) e.g. the snails *Fagotia acicularis*, *Lithoglyphus naticoides*, *Theodoxus danubialis*, the isopod *Jaera istri*, and the shrimps *Corophium curvispinum*, *Dikerogammarus haemobaphes* and *Echinogammarus ischnus*.

According to SCHÖLL & HAYBACH (2001) several macroinvertebrates (most of them widespread and common in the Danube River) can be regarded as typical species for large rivers in general. They inhabite the different longitudinal zones of the Potamal, e.g. the leeches *Dina punctata*, *D. lineata* and *Erpobdella nigricollis*, the mussels *Pisidium supinum* and *Sphaerium rivicola*, the dragonflies *Gomphus flavipes* and *G. vulgatissimus*, the beetle *Brychius elevatus* and the caddisflies *Hydroptila sparsa, Psychomyia pusilla, Hydropsyche bulgaromanorum, Brachycentrus subnubilus, Ceraclea anulicornis* and *C. dissimilis*.

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Annex 4 Significant point sources of pollution in the Danube River Basin District

1. SIGNIFICANT MUNICIPAL POINT SOURCES

1.1 Waste Water Treatment Plants with significant discharges according to agreed criteria

AV Code	Country	Discharger / location	Recipient river (river km)	Current capacity of WWTP (TPE)
6019	Germany	Memmingen	Iller	275
6105	Germany	Muenchen I	Iser	1950
1009	Austria	Spittal a.d.Drau	Drau	110
1023	Austria	Krems	Danube	184
1033	Austria	Wr.Neustadt Süd	Leitha	230
1053	Austria	Graz	Mur	400
1071	Austria	Wien-Simmering	Danube	2500
5003	Czech Republic	Olomouc	Morava (160.0)	210
10002	Slovak Republic	Bratislava Petrzalka	Danube(1862,5)	239
10011	Slovak Republic	Bratislava Vrakuna	Maly Dunaj (123,4)	288
10017	Slovak Republic	Liptov. Mikulás	Váh ( )	292
10026	Slovak Republic	Zilina-Hricov	Váh (,)	186
10039	Slovak Republic	Trnava	Trnávka (,)	108
10101	Slovak Republic	Nitra	Nitra (52,5)	51
10103	Slovak Republic	Banska Bystrica	Hron (168,4)	137
10108	Slovak Republic	Ruzomberok	Vah (314,8)	287
10110	Slovak Republic	Kosice	Hornád (,)	221
7001	Hungary	Budapest south	Danube	293
7002	Hungary	Budapest north	Danube	508
7004	Hungary	Szeged	Tisa	200
7005	Hungary	Miskolc	Tisa, Sajó	300
7006	Hungary	Gyor	Danube	150
7008	Hungary	Pécs	Dráva	340
7011	Hungary	Szombathely	Sorok-Perint, Rába	262
7013	Hungary	Debrecen	Kösely/Tisza	300
7014	Hungary	Békéscsaba	Kettos-Körös/Tisza	224
7015	Hungary	Székesfehérvár	Nádor canal Gaja creek - Jancsár creek -	277
7018	Hungary	Kecskemét	Csukás Ch.	240
11001	Slovenia	Ljubljana	Ljubljanica	360
11003	Slovenia	Domžale	Kamniška Bistrica	200

AV Code	Country	Discharger / location	Recipient river (river km)	Current capacity of WWTP (TPE)
11007	Slovenia	Ptuj	Drava	105
4001	Croatia	Cakovec	Drava	91
4002	Croatia	Varazdin	Drava	200
4003	Croatia	Koprivnica	Bistra,Drava	100
4004	Croatia	Virovitica	Martec,Zupanijski kanal,Drava	265
4005	Croatia	Belisce	Drava	220
4012	Croatia	Bjelovar	Bjelovacka,Cesma,Lonja,Trebez,Sava	100
4016	Croatia	Samobor	kanal Gradna (2),Sava	23
4018	Croatia	Krizevci	Glogovnica,Cesma,Lonja,Trebez,Sava	20
4019	Croatia	Kutina	Kutinica,Ilova,Trebez,Sava	20
4029	Croatia	Beli Manastir	Karasica,Dunav	20
2001	Bosnia-Herzegovina	Sarajevo	Bosna/Sava	600
2026	Bosnia-Herzegovina	Gradacac	Gradasnica/Tolisa/Sav	30
2031	Bosnia-Herzegovina	Srebrenik		12
13020	Serbia and Montenegro	Subotica	Palic & Ludos Lak	110
13033	Serbia and Montenegro	Kraljevo	Ibar (x) Z. Morava	156
13036	Serbia and Montenegro	Pozarevac	V. Morava	10
13057	Serbia and Montenegro	Kragujevac	Lepenica (x) V. Morava	125
3001	Bulgaria	Sofia	Iskar	1300
3003	Bulgaria	Veliko Tarnovo	Yantra	120
3006	Bulgaria	Pleven	Vit	160
3008	Bulgaria	Gabrovo	Yantra	100
3011	Bulgaria	Vratza	Ogosta	140
3042	Bulgaria	Kubrat	Suha	11
9001	Romania	Calarasi	Danube	90
9006	Romania	Botosani	Prut-Sitna	140
9007	Romania	Iasi	Prut-Bahlui	400
9009	Romania	Vaslui	Siret-Vasluiet	90
9011	Romania	Roman	Siret	90
9012	Romania	Focsani	Siret-Putna	110
9013	Romania	Suceava	Siret-Suceava	130
9014	Romania	Piatra Neamt	Siret-Bistrita	160
9015	Romania	Bacau	Siret-Bistrita	206
9016	Romania	Buzau	Buzau	207
9018	Romania	Targoviste	Ialomita	120

AV Code	Country	Discharger / location	Recipient river (river km)	Current capacity of WWTP (TPE)
9019	Romania	Slobozia	Ialomita	60
9020	Romania	Ploiesti	Ialomita-Dâmbu	260
9024	Romania	Sibiu	Olt-Cibin	213
9025	Romania	Brasov	Olt-Ghimbasel	320
9026	Romania	Petrosani	Jiu	154
9027	Romania	Tg. Jiu	Jiu	125
9029	Romania	Lugoj	Timis	60
9030	Romania	Resita	Timis-Bârzava	30
9031	Romania	Timisoara	Bega	300
9034	Romania	Deva	Mures	85
9036	Romania	Alba Iulia	Mures	80
9037	Romania	Hunedoara	Mures-Cerna	90
9040	Romania	Tg. Mures	Mures	200
9041	Romania	Arad	Mures	210
9042	Romania	Oradea	Cris-Cris Repede	240
9043	Romania	Zalau	Somes - Zalau	69
9045	Romania	Bistrita	Somes	90
9047	Romania	Satu Mare	Somes	125
9048	Romania	Baia Mare	Somes-Sasar	150
9049	Romania	Cluj	Somes-Somes Mic	380
9053	Romania	Pitesti	Arges	210
9064	Romania	Blaj	Mures - Tarnava Mare	25
9073	Romania	Codlea	Olt - Vulcanita	26
9074	Romania	Cisnadie	Olt-Cibin	20
9078	Romania	Mioveni	Arges-Doamnei	35
9092	Romania	Oltenita	Danube	35
9095	Romania	Beius	Cris -Cris Negru	14
9096	Romania	Gheorgheni	Mures	30
9098	Romania	Sovata	Mures - Tarnava Mica	18
9099	Romania	Orsova	Danube	20
9106	Romania	Jimbolia	Bega Veche	12
9116	Romania	Bals	Oltet	17
9117	Romania	Corabia	Danube	15
	Romania	Constanta	Black Sea	300
12005	Ukraine	Uzhgorod	Uzh	188

1.2 Untreated waste water from agglomerations > 10,000 PE

AV Code	Country	Discharger/location	Recipient river (river km)	Estimated raw water load (TPE)
10004	Slovak Republic	Stúrovo	Danube (1718,1)	17
10041	Slovak Republic	Komárno	Váh (,)	23
7003	Hungary	Budapest	Danube	855
11002	Slovenia	Maribor	Drava	190
11005	Slovenia	Celje	Sava	85
11018	Slovenia	Rogaška Slatina	Sava	12
4006	Croatia	Osijek	Drava	206
4007	Croatia	Vukovar	Dunav	100
4008	Croatia	Zagreb	Sava	1074
4009	Croatia	Sisak	Sava	53
4010	Croatia	Karlovac	Kupa	75
4011	Croatia	Slavonski Brod	Sava	60
4013	Croatia	Zapresic	Krapina (1), Sava	na
4015	Croatia	Sesvete	Crnec(20) ka.Lonja-Strug,Sava	na
4020	Croatia	Petrinja	Kupa, Sava	6
4021	Croatia	Nova Gradiska	Šumetlica,Sava	10
4022	Croatia	Pozega	Orljava,Sava	7
4023	Croatia	Dakovo	Kanal Ribnjak,Josava,Bid, Bosut,Sava	10
4024	Croatia	Vinkovci	Bosut,Sava	10
4025	Croatia	Zupanja	Sava	6
4027	Croatia	Slatina	Slatinska Cadavica,Drava	8
4028	Croatia	Nasice	Nasicka rijeka,Vucica,Drava	7
2002	Bosnia-Herzegovina	Zenica	Bosna/Sava	163.2
2004	Bosnia-Herzegovina	Tuzla	Jala/Spreca/Bosna/Sava	89.404
2007	Bosnia-Herzegovina	Hadzici	Bosna/Sava	17.378
2008	Bosnia-Herzegovina	Ilijas	Bosna/Sava	11.4
2009	Bosnia-Herzegovina	Kakanj	Bosna/Sava	29.8
2010	Bosnia-Herzegovina	Zavidovici	Bosna/Sava	646.5
2018	Bosnia-Herzegovina	Visoko	Bosna/Sava	163.2
2024	Bosnia-Herzegovina	Jajce	Vrbas/Sava	14.4
2025	Bosnia-Herzegovina	Tuzla	Jala/Spreca/Bosna/Sava	89.4
2028	Bosnia-Herzegovina	Gracanica		13.6

AV Code	Country	Discharger/location	Recipient river (river km)	Estimated raw water load (TPE)
2029	Bosnia-Herzegovina	Banovici	Litva/Spreca/Bosna/Sava	16.3
2039	Bosnia-Herzegovina	Bihac	Una/Sava	71.1
2040	Bosnia-Herzegovina	Bosanska Krupa	Una/Sava	14.9
2041	Bosnia-Herzegovina	Cazin	/Korana/Sava	18.8
2042	Bosnia-Herzegovina	Velika Kladusa	Glina/Kupa/Sava	13.7
13001	Serbia and Montenegro	City of Belgrade	Danube	2078
13006	Serbia and Montenegro	Novi Sad I (Left Bank)	Danube	311
13007	Serbia and Montenegro	Nis	Nisava	269
13010	Serbia and Montenegro	Pancevo	Danube	73
13012	Serbia and Montenegro	Leskovac	J. Morava	81
13016	Serbia and Montenegro	Sabac	Sava	56
13018	Serbia and Montenegro	Valjevo (CW)	Kolubra	42
13024	Serbia and Montenegro	Bor	Borska r.	16
13025	Serbia and Montenegro	Pirot	Nisava	58
13032	Serbia and Montenegro	S. Mitrovica	Sava	58
13034	Serbia and Montenegro	Smederevo	Danube	41
13049	Serbia and Montenegro	Loznica	Drina	15
13050	Serbia and Montenegro	Novi Sad II (Right Bank)	Danube	18
13055	Serbia and Montenegro	Vrbas	DTD Kanal	14
3002	Bulgaria	Rousse	Danube	183
3004	Bulgaria	Gorna Oriahowitza	Yantra	85
3005	Bulgaria	Montana	Ogosta	55
3013	Bulgaria	Lovech	Osam	61
3014	Bulgaria	Svistov	Danube	50
3015	Bulgaria	Sevlievo	Rositza/Yantra	48
3016	Bulgaria	Silistra	Danube	47
3017	Bulgaria	Cherven briag	Iskar	20
3018	Bulgaria	Popovo	Russenski Lom	23
3019	Bulgaria	Vidin	Danube	72
3020	Bulgaria	Lom	Danube	33
3030	Bulgaria	Dulovo	Suha	14
3033	Bulgaria	Lukovit	Iskar	15
3034	Bulgaria	Belene	Danube	15
3035	Bulgaria	Biala	Yantra	15
3036	Bulgaria	Omurtag	Yantra	11

AV Code	Country	Discharger/location	Recipient river (river km)	Estimated raw water load (TPE)
3037	Bulgaria	Drianovo	Yantra	11
3039	Bulgaria	Svoge	Iskar	11
3040	Bulgaria	Bankia	Osam	11
3045	Bulgaria	Berkovitsa	Ogosta	24
3046	Bulgaria	Kozloduy	Danube	23
3047	Bulgaria	Biala Slatina	Ogosta	21
3048	Bulgaria	Novi Iskar	Iskar	20
3049	Bulgaria	Pavlikeni	Yantra	20
3050	Bulgaria	Knezha	Iskar	19
3051	Bulgaria	Mezdra	Iskar	19
3052	Bulgaria	Kostinbrod	Iskar	18
3053	Bulgaria	Teteven	Vit	17
3054	Bulgaria	Etropole	Iskar	17
3055	Bulgaria	Triavna	Yantra	20
3056	Bulgaria	Tutrakan	Danube	16
9003	Romania	Tulcea	Danube	104
9004	Romania	Drobeta Tr. Severin	Danube	158
9005	Romania	Braila	Danube	244
9017	Romania	Galati	Danube	315
9028	Romania	Craiova	Jiu	385
9054	Romania	Bucuresti	Arges-Dâmbovita	2400
9055	Romania	Cernavoda	Danube	19
9093	Romania	Fetesti	Danube - Borcea	40
9103	Romania	Bocsa	Timis-Bârzava	20
9105	Romania	Moldova Noua	Danube	16
9108	Romania	Oravita	Caras-Oravita	17.5
9110	Romania	Rovinari	Jiu	14
9113	Romania	Bailesti	Balasan	21
9114	Romania	Calafat	Danube	15

II. SIGNIFICANT INDUSTRIAL POINT SOURCES

AV Code	Country	Discharger / location	Recipient river (river km)	Sector
6501	Germany	Sappi Ehingen AG	Danube	pulp and paper industry
6503	Germany	Wacker Chemie GmbH	Inn	chemical industry
6506	Germany	MD Papier Plattling	Isar	pulp and paper industry
6507	Germany	Haindl Papier Schongau	Lech	pulp and paper industry
6508	Germany	Gebr. Lang AG Ettringen	Lech	pulp and paper industry
1502	Austria	Jungbunzlauer GmbH&CoKG	March (Morava)	food industry
1503	Austria	Lenzing AG	Traun (T)	pulp and paper industry
1504	Austria	Steyrermühl AG	Traun	pulp and paper industry
1505	Austria	SCA Laakirchen	Traun	pulp and paper industry
1506	Austria	MReal AG Hallein	Salzach	pulp and paper industry
1507	Austria	Leykam Gratkorn	Mur	pulp and paper industry
1508	Austria	Norske Skog Bruck/Mur	Mur	pulp and paper industry
1509	Austria	Zellstoff Pöls	Mur (T)	pulp and paper industry
1510	Austria	Biochemie GmbH Kundl	Inn	chemical industry
1512	Austria	Neusiedler AG Kematen	Ybbs/Danube	pulp and paper industry
5501	Czech Republic	JEDU - Dukovany	Skryjsky brook	other relevant industry
5502	Czech Republic	Kozeluzny (SPECO) Otrokovice	Morava	leather industry
5503	Czech Republic	FOSFA-Breclav-Postorna	Dyje/Morava	chemical industry
5504	Czech Republic	ENERGOAQUA, a.s. Roznov pod Radhostem		other relevant industry
5505	Czech Republic	STV GLASS, a.s. Valasské Mezirici		other relevant industry
5506	Czech Republic	DEZA, a.s. Valasske Mezirici		chemical industry
5507	Czech Republic	LG.Philips Displays s.r.o. Hranice		other relevant industry
5508	Czech Republic	Ales Koutny - ALFACHROM Litovel (provozovna Plackeho 34)		other relevant industry
5509	Czech Republic	ALIACHEM, a.s. - o.z. Fatra Napajedla		chemical industry
5510	Czech Republic	MESIT energo, s.r.o. Uherske Hradiste		other relevant industry
10501	Slovak Republic	Istrochem Bratislava	Danube (1863,8)	chemical industry
10502	Slovak Republic	KAPPA Sturovo	Danube (1722)	pulp and paper industry
10503	Slovak Republic	Slovnaft, bl. 17, Bratislava	Small Danube - , (Váh)	chemical industry
10504	Slovak Republic	Novaky Chem. Plants	Nitra (129,7)	chemical industry
10505	Slovak Republic	Power Plant Vojany	Laborec-10,5 (Bodrog)	other relevant industry
10506	Slovak Republic	Bukocel Hencovce	Ondava - 48,65 (Bodrog)	other relevant industry
7501	Hungary	Dunapack (Dunaújváros)	Danube	pulp and paper industry
7502	Hungary	Wood Ind. (Mohács)	Danube	other relevant industry

AV Code	Country	Discharger / location	Recipient river (river km)	Sector
7503	Hungary	Dunaferr I.	Danube	iron and steel industry
7504	Hungary	MOL Rt. (Százhalombatta)	Danube	other relevant industry
7505	Hungary	Nitrokémia (Balatonfuzfo)	Séd/Danube	fertiliser industry
7507	Hungary	Sugar Factory (Szolnok)	Tisza	food industry
7508	Hungary	Agroferm (Kaba)	Kösely/Tisza	food industry
7509	Hungary	Paper Fact. (Lábatlan)	Danube	pulp and paper industry
7510	Hungary	Thermal Water (Szarvas)	Körös/Tisza	other relevant industry
7511	Hungary	ICN Alkaloida	Tisza	other relevant industry
7513	Hungary	Richter G. Ch. W. (Dorog)	Danube	chemical industry
7514	Hungary	Leather Factory (Pécs)	Dráva	leather industry
7516	Hungary	Agroindustry Ltd (Környe)	Danube	food industry
7517	Hungary	Flóratom Kft. Szeged-Szentmihálytelep	Tisza	food industry
7520	Hungary	Yeast and Alc. Fact. (Gyor)	Danube	food industry
7521	Hungary	ZOLTEK plc (Nyergesújfalu)	Danube	chemical industry
7522	Hungary	Nitrogen Works (Pétfürdo)	Séd/Danube	fertiliser industry
7523	Hungary	Yeast and Alcohol Fact. (Budapest)	Danube	food industry
7524	Hungary	SZOLE-MEAT Ltd (Szolnok)	Tisza	food industry
7526	Hungary	Waste Management (Sajóbábony)	Sajó/Tisza	other relevant industry
7531	Hungary	Csepel Works	Danube	iron and steel industry
7533	Hungary	Tisza Chemical Works (Szolnok)	Tisza	chemical industry
7548	Hungary	MC plc Sugar Factory (Petoháza)	Rábca/Danube	food industry
7549	Hungary	DUNAPACK plc (Csepel)	Danube	pulp and paper industry
11501	Slovenia	Paloma/Sladki vrh	Mura	pulp and paper industry
11507	Slovenia	VIPAP Videm Krsko	Sava	pulp and paper industry
4503	Croatia	Complex "Belisce", Belisce	Drava	pulp and paper industry
4504	Croatia	Sugar factory Osijek (*)	Drava	food industry
4506	Croatia	"Pliva" Savski Marof	Gorjak,Sava	chemical industry
4508	Croatia	"Petrokemija Kutina", Kutina	Kutinica,Ilova,Trebez,Sava	fertiliser industry
4509	Croatia	Sugar factory "Zupanja", Zupanja	Sava	food industry
4513	Croatia	"Pliva" Zagreb (*)	Sava	chemical industry
4515	Croatia	Zagreb brewery, Zagreb (*)	Sava	food industry
4516	Croatia	"Kras" Zagreb (*)	Sava	food industry
4527	Croatia	PAN (*)	Sava	pulp and paper industry
4528	Croatia	Herbos Sisak (*)	Sava	chemical industry
2502	Bosnia-Herzegovina	BH Steel -Zeljezara, Iron and steel, Zenica	Bosna/Sava	iron and steel industry
2506	Bosnia-Herzegovina	Termoelektrana, Tuzla	Jala/Spreca/Bosna/Sava	other relevant industry

AV Code	Country	Discharger / location	Recipient river (river km)	Sector
2533	Bosnia-Herzegovina	Termoelektrana, Kakanj	Bosna/Sava	other relevant industry
2555	Bosnia-Herzegovina	Tvornica alata, Gorazde	Drina/Sava	other relevant industry
2556	Bosnia-Herzegovina	Unis Pobjeda, Gorazde	Drina/Sava	other relevant industry
13502	Serbia and Montenegro	RTB Bor, mining and flotation Bor	Borska reka (x) Timok (x) Danube	mining
13505	Serbia and Montenegro	TENT-A, Obrenovac	Sava	other relevant industry
13506	Serbia and Montenegro	Sugar Mill "Crvenka", Crvenka	DTD canal	food industry
13507	Serbia and Montenegro	Sugar Mill "Backa" , Vrbas	DTD kanal	food industry
13508	Serbia and Montenegro	RTB Bor, mining and flotation, Majdanpek	Pek (x) Dunav	mining
13509	Serbia and Montenegro	Carnex, Vrbas	DTD canal	food industry
13510	Serbia and Montenegro	Viskoza, Loznica	Drina (x) Sava	pulp and paper industry
13511	Serbia and Montenegro	AD ALLTECH-Fermin , Senta	Tisa	other relevant industry
13512	Serbia and Montenegro	Sugar Mill "TE-TO", Senta	DTD canal	food industry
13515	Serbia and Montenegro	TENT-B, Obrenovac	Sava	other relevant industry
13518	Serbia and Montenegro	DP HIP Petrohemija, Pancevo	canal (x) Danube	chemical industry
13519	Serbia and Montenegro	NIS RNP, Pancevo	canal (x) Danube	chemical industry
13520	Serbia and Montenegro	"Jagodinska pivara" AD, Jagodina	Lugomir (x) V. Morava	food industry
13523	Serbia and Montenegro	Oil refinery, Novi Sad	kolektor Sever IV (x) Danube	chemical industry
3501	Bulgaria	Sviloza/Svishtov (1)	Danube	chemical industry
3505	Bulgaria	Lesoplast/Trojan (1)	Osam	other relevant industry
3506	Bulgaria	Velur/Lovetch (1)	Osam	leather industry
3507	Bulgaria	Sugar Factory/G.Orjachovtza(3)	Yantra	food industry
9501	Romania	Phoenix Baia Mare	Somes-Sasar	mining
9502	Romania	Somes Dej	Somes	pulp and paper industry
9503	Romania	Terapia Cluj	Somes-Somes Mic	chemical industry
9506	Romania	Sometra Copsa Mica	Mures-Tarnava Mare	chemical industry
9508	Romania	E.M.Abrud	Mures-Aries	mining
9510	Romania	E.M. Rosia Montana	Mures-Abrudel	mining
9511	Romania	Ind. Sarmei Campia Turzii	Mures-Racosa	iron and steel industry
9513	Romania	Nitramonia Fagaras	Olt-Berivoi	fertiliser industry
9514	Romania	Oltchim Rm. Valcea	Olt	chemical industry
9520	Romania	Viromet Victoria	Olt-Ucea-Corbul Ucei	chemical industry
9521	Romania	Dacia Pitesti	Arges-Doamnei	iron and steel industry
9522	Romania	Arpechim Pitesti	Arges-Dâmbovnic	chemical industry
9523	Romania	Petrobrazi Ploiesti	Ialomita-Prahova	chemical industry
9525	Romania	Astra Romana Ploiesti	Ialomita-Dâmbu	chemical industry
9527	Romania	SC Letea SA Bacau	Siret-Bistrita	pulp and paper industry

AV Code	Country	Discharger / location	Recipient river (river km)	Sector
9532	Romania	SC Carom SA Onesti	Siret-Trotus	chemical industry
9533	Romania	Sidex Galati	Siret-Malina	iron and steel industry
9536	Romania	Alum Tulcea	Danube	metal surface treatment
9537	Romania	S.C.TURNU S.A. Tr. Magurele	Danube	fertiliser industry
9557	Romania	Spirt Ghidigeni	Siret-Bârlad	food industry
9563	Romania	E.M.Baia Borsa	Tisa-Viseu	mining
9564	Romania	E.M.Cavnic	Somes-Cavnic	mining
9565	Romania	E.M.Herja	Somes-Firiza	mining
9566	Romania	E.M.Baia Sprie	Somes-Sasar	mining
9567	Romania	Romplumb Baia Mare	Somes-Sasar	mining
9568	Romania	E.M.Brad-Barza	Cris-Cris Alb	mining
9573	Romania	Ampellum Zlatna	Mures-Ampoi	mining
9574	Romania	E.M.Baia de Aries	Mures-Aries	mining
9575	Romania	E.M.Coranda Certej	Mures-Certej	mining
9576	Romania	UCMR Resita	Timis-Bârzava	iron and steel industry
9577	Romania	C.S.Resita	Timis-Bârzava	iron and steel industry
9578	Romania	Gavazzi Steel Otelu Rosu	Timis-Bistra Marului	iron and steel industry
9579	Romania	Celrom Tr.Severin	Danube	other relevant industry
9580	Romania	S.C.Balan	Olt-Varsaraia	mining
9581	Romania	Alro Slatina	Olt-Milcov	iron and steel industry
9587	Romania	S.C.Cotnari	Prut-Bahlui	food industry
9588	Romania	I.M.Moldova Noua	Danube	mining
9591	Romania	S.C.CUG Cluj	Somes-Somes Mic	iron and steel industry
9593	Romania	Flotatia Centrala Baia Mare	Somes-Lapus	mining
9594	Romania	E.M.Baiut	Somes-Lapus	mining
9596	Romania	Bicapa Târnaveni	Mures-Târnava Mica	chemical industry
9614	Romania	E.M.Rodna	Somes	mining
9615	Romania	"Cominco"S.A.Bucovina Frasin-Ape mina	Somes - V. Vinului	mining
9616	Romania	SC"Intrepr.Montaj-Instalatii"SA Baia Mare	Somes - Baita	metal surface treatment
9617	Romania	E.M.Turt	Tisa - Turt	mining
9619	Romania	S.C.Metrom S.A.	Canal Timis	metal surface treatment
9620	Romania	S.C. Mecanica S.A. Marsa	Olt-Marsa	metal surface treatment
9622	Romania	Celhart-Donaris	Danube	pulp and paper industry
	Romania	S.C Rompetrol Petromidia	Black Sea	chemical industry
12501	Ukraine	Cardboard factory, Rachiv	Tisa	pulp and paper industry
12502	Ukraine	Forest exploration factory, Velyky Bichkov	Tisa	pulp and paper industry

AV Code	Country	Discharger / location	Recipient river (river km)	Sector
12503	Ukraine	Forest exploration factory, Teresva	Tisa	pulp and paper industry
12504	Ukraine	Cardboard - Paper factory, Izmail	Danube (78)	pulp and paper industry
12505	Ukraine	"PolisTok", Kiliya	Danube (45)	

III. SIGNIFICANT AGRICULTURAL POINT SOURCES (ANIMAL FARMS)

AV Code	Country	Discharger / location	Recipient river (river km)	Type
11508	Slovenia	Farme Ihan	Kamniška Bistrica / Sava	pigs
9543	Romania	Agroflip Bontida	Somes-Somes Mic	pigs
9544	Romania	Nutrisam Moftin	Somes-Crasna	pigs
9550	Romania	Comtim Group Beregsau	Bega-Bega Veche	pigs
9556	Romania	SC Agricola International SA Bacau	Siret	chicken
9572	Romania	Agroflip Gornesti	Mures	pigs
9597	Romania	Suinprod Let	Olt-Raul Negru	pigs
9598	Romania	Europig Sercaia	Olt-Sercaia	pigs
9599	Romania	Prodsuis Stanilesti	Prut	pigs
9601	Romania	Luca Suinprod Codlea	Olt-Vulcanita	pigs
9602	Romania	Suinprod Babeni	Olt-Luncavat	pigs
9606	Romania	Comtim Group Periam	Mures	pigs
9607	Romania	Avia Agrobanat Bocsa	Barzava	chicken
9609	Romania	Avicola Babeni	Olt-Luncavat	chicken
9610	Romania	Suintest Oarja	Arges-Dambovnic	pigs
9612	Romania	Suinprod Zimnicea	Danube	pigs
9613	Romania	Complex Braila	Danube	pigs
9623	Romania	Carniprod Tulcea	Danube-Sf.Gheorghe Branch	pigs

ANNEX 5 Major Hydraulic Structures in the Danube River Basin District

GERMANY

Name **River section** ***rkm-rkm***	**Free-flowing section** ***rkm-rkm***	**Regulated/ canalised** **artificial bank, dike line along main river bed etc.** ***rkm-rkm***	**Impounded river section** **Storage volume** ***rkm – rkm***	**Name** **of dam, polder or reservoir** ***at rkm***
DANUBE 2,780 – 2,581			Series of 27 weirs between Donaueschingen (rkm 2,780) and Ulm (rkm 2,588) Then, the following 22 dams:	
2,581 – 2,200 (580 km)	183 km	139 km	*1,66 hm^3 Ulm/Böfinger Halde 2,581*	
			2,17 hm^3 Oberelchingen 2,575	
			2,21 hm^3 Leipheim 2,568	
			1,75 hm^3 Günzburg 2,562	
			1,92 hm^3 Offingen 2,556	
			130 hm^3 Gundelfingen 2,551.95	
			4,02 hm^3 Faimingen 2,545,6	
			2,06 hm^3 Dillingen 2,538	
			2,93 hm^3 Höchstädt 2,530	
			2,25 hm^3 Schwenningen 2,522	
			4,36 hm^3 Donauwörth 2,511	
			5,56 hm^3 Bertoldsheim 2,490	
			4,04 hm^3 Bittenbrunn 2,480	
			4,82 hm^3 Bergheim 2,466.7	
			6,49 hm^3 Ingolstadt 2,459	
			9,70 hm^3 Vohburg 2,444	
			5,30 hm^3 Bad Abbach 2,401	
			15.68 hm^3 Regensburg at 2,381.3	
			Triebwerk Regensburg 2,381.,1	
			36.20 hm^3 Geisling at 2,354.00	
			23.00 hm^3 Straubing at 2,324.00	
			27.08 hm^3 Kachlet at 2,230.70	
			44.57 hm^3 Jochenstein 2,203,33	
MAIN			Hiltpoldstein, Riedenburg, Kelheim	

Name **River section** ***rkm-rkm***	**Free-flowing section** ***rkm-rkm***	**Regulated/ canalised** **artificial bank, dike line along main river bed etc.** ***rkm-rkm***	**Impounded river section** **Storage volume** ***rkm – rkm***	**Name** **of dam, polder or reservoir** ***at rkm***
DANUBE Canal				
LECH **167.5km**	Except for 15 km German section is almost completely impounded	167.5	153.5	
			There are altogether **32 dams** on the Lech (out of it 3 with running mode – e.g. Gersthofen and Meitingen and 29 with hydro-peaking): *Feldheim, Rain, Oberpeiching, Ellgau, Meitingen, Langweid, Gersthofen, Wolfzahnau, Merching, Unterbergen, Prittriching, Scheuring, Schwabstadl, Kaufering, Landsberg, Pitzling, Dornstettten, Lechmühlen, Lechblick, Epfach, Apfeldorf, Sperber, Finsterau, Dornau, Dessau, Urspring, Lechbruck,Prem,FüssenHorn, Hanfwerke, Forggensee/Roßhaupten, Kinsau, Dornau am Lech, Schongau,*	
NAAB **98.3 km**	Mainly free-flowing			
ISAR **263.3 km**	59 km	Dyke system: 86 km, diversion system 55 km	There are altogether **17 dams** on the Isar: *Pielweichs, Ettling, Landau, Gottfrieding, Dingolfing, Gummering, Niederaichbach, Altheim, UppenbornI u. II., Pfrombach, Eitting, Aufkirchen, Finsing, Südwerke, Pullach, Höllriegelskreuth, Mühltal,Bad Tölz, Sylvensteinwerk, Walchenseekraftwerk, Aufkirchen, Obernachkraftwerk, Maxwehr, Hammerinsel*	
INN **217.6 km**	Practically none in D (22 km)	Regulated, 22,8 km diverted	There are altogether **15 dams** on the Inn: *Passau-Ingling, Schärding Neuhaus, Egglfing, Ering,, Braunau-Simbach, Stammham, Perach, Töging, Gars, Teufelsbruck, Soyenseerwerk, Wasserburg, Feldkirchen, Rosenheim,; Nußdorf and Oberaudorf-Ebbs (together with Austria), Neuötting*	

AUSTRIA

Name **River section** ***from rkm - rkm***	**Free-flowing section** ***from rkm - rkm***	**Strongly regulated** **Canalized; artificial bank, dike line along main river bed etc.** ***from rkm - rkm***	**Impounded river section** **Length of impoundment** ***from rkm - rkm***	**Name of impoundment** **e.g. dam for power generation, or reservoir for water supply**
DANUBE			Rkm 2,203-2,214	*Jochenstein*
		2,186-2,203	Rkm 2,162-2,187	*Aschach*
		2,156-2,162	Rkm 2,146-2,156	*Ottensheim*

Name **River section** ***from rkm - rkm***	**Free-flowing section** ***from rkm - rkm***	**Strongly regulated** **Canalized; artificial bank, dike line along main river bed etc.** ***from rkm - rkm***	**Impounded river section** **Length of impoundment** ***from rkm - rkm***	**Name of impoundment** **e.g. dam for power generation, or reservoir for water supply**
327 km		2,130-2,146	Rkm 2,119-2,130	*Abwinden*
		2,106-2,119	Rkm 2,096-2,107	*Wallsee*
		2,072-2,095	Rkm 2,060-2,072	*Ybbs-Persenbeug*
		2,049-2,060	Rkm 2,038-2,049	*Melk*
		2,200-1,873	Rkm 2,038-2,010	*Wachau*
		1,998-2,038	Rkm 1,980-1,998	*Altenwörth*
		1,963-1,979	Rkm 1,949-1,963	*Greifenstein*
		1,929-1,949	Rkm 1,921-1,929	*Freudenau*
INN			There are altogether **4 dams** on the Inn in Austria– one (Nussdorf) is situated in Germany with it's impoundment reaching into Austria.	
			3 km	*Imst*
281 km	245,9 km		2,7 km	*Kirchbichl*
			10 km	*Langkampfen*
			14,7 km	*Oberaudorf-Ebbs*
			4,7 km (in Austria)	*Nussdorf, (Germany)*
SALZACH			There are altogether **10 dams** on the Salzach; 6 of them cause a continuous chain of impoundments.	
			1,2 km	*Schwarzach*
			21,2 km	
			1,5 km	*Wallnerau*
			3,3 km	*St. Johann*
220 km	189 km		3 km	*St. Veit*
			4,6 km	*Urreiting*
			4,4 km	*Bischofshofen*
			4,4 km	*Kreuzbergmaut*
			1,8 km	*Hallein Papierfabrik*
			1,5 km	*Hallein Sohlstufe*
			5,5 km	*Urstein*
TRAUN			There are altogether **21 dams** on the Traun.	
130 km			*Haas (Traun upper reach)*	

Name **River section** ***from rkm - rkm***	**Free-flowing section** ***from rkm - rkm***	**Strongly regulated** **Canalized; artificial bank, dike line along main river bed etc.** ***from rkm - rkm***	**Impounded river section** **Length of impoundment** ***from rkm - rkm***	**Name of impoundment** **e.g. dam for power generation, or reservoir for water supply**
			Stögermühle (Traun upper reach)	
			KW Bad Aussee (Traun upper reach)	
			Eiselmühle (Bad Goisern)	
			Goiserer Mühle (Bad Goisern)	
			KW Lauffen (Bad Goisern-Anzenau)	
			KW Gmunden (Gmunden)	
			Danzermühle (Laakirchen)	
			Kohlwehr (Laakirchen)	
			Papierfabrik Steyrermühl (Steyrermühl)	
			Gschröff (Steyrermühl)	
			Siebenbrunn (Ficht)	
			KW Traunfall (Traunfall)	
			KW Kemating (Kemating)	
			HITIAG links (Stadl Paura)	
			HITIAG rechts (Stadl Paura)	
			KW Lambach (Lambach)	
			KW Wels (Gunskirchen)	
			KW Marchtrenk (Marchtrenk)	
			KW Traun-Pucking (Traun-Haid)	
			KW ESG (Linz)	
ENNS			There are altogether **16 dams** on the Enns– 2 are small with no significant impoundment, 8 cause a continuous chain of impoundments.	
			no impoundment	***Pewny (Flachau)***
			no impoundment	***Lackner (Radstadt)***
			1,5 km	***Hieflau***
			2 km	***Wandau (Landl)***
252 km	161,4 km		1,3 km	***Großreifling (Krippau)***
			1,9 km	***Essling/Altenmarkt***
			7 km	***Schönau***
			9 km	***Weyer***

Name River section *from rkm - rkm*	Free-flowing section *from rkm - rkm*	Strongly regulated Canalized; artificial bank, dike line along main river bed etc. *from rkm - rkm*	Impounded river section Length of impoundment *from rkm - rkm*		Name of impoundment e.g. dam for power generation, or reservoir for water supply
			67,9 km	13 km	***Großraming***
				9 km	***Losenstein***
				7,8 km	***Ternberg***
				7,5 km	***Rosenau***
				5,2 km	***Garsten-St. Ulrich***
				13,7 km	***Staning***
				6 km	***Mühlrading***
				5,7 km	***St. Pantaleon***
MUR			There are altogether **28 dams** on the Mur in Austria – one is situated in Slovenia with its impoundment reaching into Austria - ; there are 2 continuous chains of impoundments (one with 3 dams and the other with 6 dams).		
			0,3 km		***Hintermuhr-Plölitzen***
			0,5 km		***Murfallwerk.Speicher Ölschützen***
356,5 km	278,8		1,6 km		***Bodendorf***
			1,9 km		***St. Georgen***
			0,8 km		***St. Ägidi***
			2,3 km		***Unzmarkt***
			9,2 km	3,3 km	***Judenburg I***
				0,9 km	***Judenburg II - Murdorf***
				5 km	***Fisching***
			0,3 km		***Mühlbach Judendorf***
			0,5 km		***Leoben***
			0,8 km		***Mühlbach Gstattmoarhof***
			1,2 km		***St. Dionysen***
			1,2 km		***weir in Unteraich***
			5,1 km		***Pernegg***
			2,5 km		***Laufnitzdorf***
			1,1 km		***Papierfabrik Peugen***
			1,5 km		***weir in Wannersdorf***
			4,5 km		***Rabenstein***

<table>
<tr><th>Name

River section
from rkm - rkm</th><th>Free-flowing section
from rkm - rkm</th><th>Strongly regulated

Canalized; artificial bank, dike line along main river bed etc.
from rkm - rkm</th><th colspan="2">Impounded river section

Length of impoundment
from rkm - rkm</th><th>Name of impoundment

e.g. dam for power generation, or reservoir for water supply</th></tr>
<tr><td rowspan="12"></td><td rowspan="12"></td><td rowspan="12"></td><td colspan="2">2,4 km</td><td>Peggau</td></tr>
<tr><td colspan="2">1,8 km</td><td>Friesach</td></tr>
<tr><td colspan="2">5,3 km</td><td>weir in Weinzödl(Grazer Mühlbach)</td></tr>
<tr><td rowspan="6">30,3 km</td><td>3 km</td><td>Mellach</td></tr>
<tr><td>7,6 km</td><td>Lebring</td></tr>
<tr><td>4 km</td><td>Gralla</td></tr>
<tr><td>5,4 km</td><td>Grabersdorf</td></tr>
<tr><td>4,7 km</td><td>Obervogau</td></tr>
<tr><td>5,6 km</td><td>Spielfeld</td></tr>
<tr><td colspan="2">2,6 km (in Austria)</td><td>dam in Slovenia with it’s impoundment reaching into Austria</td></tr>
<tr style="display:none"></tr>
<tr style="display:none"></tr>
<tr><td rowspan="11">DRAU

258,5 km</td><td rowspan="11">139,5 km</td><td rowspan="11"></td><td colspan="3">There are all together 10 dams on the DRAU– at the deadline of this paper only the following information was found (see Map 12):</td></tr>
<tr><td colspan="2">5,9 km</td><td>Paternion</td></tr>
<tr><td colspan="2">6,3 km</td><td>Kellerberg</td></tr>
<tr><td colspan="2">7,6 km</td><td>Villach</td></tr>
<tr><td colspan="2">15,5 km</td><td>Rossegg-St. Jakob</td></tr>
<tr><td colspan="2">15 km</td><td>Feistritz-Ludmannsdorf</td></tr>
<tr><td colspan="2">10,6 km</td><td>Ferlach-Maria Rain</td></tr>
<tr><td colspan="2">14,6 km</td><td>Annabrücke</td></tr>
<tr><td colspan="2">21 km</td><td>Edling</td></tr>
<tr><td colspan="2">16,4 km</td><td>Schwabeck</td></tr>
<tr><td colspan="2">6,1 km</td><td>Lavamünd</td></tr>
<tr><td rowspan="5">LECH</td><td rowspan="5"></td><td rowspan="5"></td><td colspan="3">There are all together 5 dams on the Lech in Austria; 3 of them are situated in the upper reaches of the river, do not cause any impoundments and are passable for fish (Tirolerwehr); the other two have unknown lengths of impoundments - at the deadline of this paper only the following information was found (see Map 12):</td></tr>
<tr><td colspan="2">no impoundment</td><td>Tirolerwehr 1 in upper reach</td></tr>
<tr><td colspan="2">no impoundment</td><td>Tirolerwehr 2 in upper reach</td></tr>
<tr><td colspan="2">no impoundment</td><td>Tirolerwehr 3 in upper reach</td></tr>
<tr><td colspan="2">length not known</td><td>Weir in Platten-Ehenbichl</td></tr>
</table>

Name **River section** ***from rkm - rkm***	**Free-flowing section** ***from rkm - rkm***	**Strongly regulated** **Canalized; artificial bank, dike line along main river bed etc.** ***from rkm - rkm***	**Impounded river section** **Length of impoundment** ***from rkm - rkm***	**Name of impoundment** **e.g. dam for power generation, or reservoir for water supply**
			length not known	*KW Kniepaß*
THAYA			na	
RAAB			There are all together 17 dams on the Raab; 10 are not known by name but only by location - at the deadline of this paper only the following information was found (see Map 12):	
			0,4 km	*KW Raabklamm*
			0,2 km	*weir in Oberndorf*
99,4 km	85,3 km		0,4 km	*weir in St. Ruprecht*
			0,4 km	*weir in Gleisdorf*
			0,3 km	*weir south of Gleisdorf*
			0,3 km	*weir in Sulz bei Gleisdorf*
			0,8 km	*weir in Morgensdorf*
			0,3 km	*weir in Zöbing an der Raab*
			0,5 km	*Clementmühle*
			0,2 km	*weir in Fladnitzberg*
			1,1 km	*KW Raab Lugitsch*
			1 km	*KW Clement KG*
			0,4 km	*KW Ertlermühle*
			0,3 km	*weir in Lödersdorf*
			1,2 km	*KW Pertlsteinmühle in Johnsdorf*
			3,8 km	*weir in Fehring*
			2,5 km	*KW Hohenbrugg*
RABNITZ			There are no dams on the Rabnitz.	

CZECH REPUBLIC

Name	Free-flowing section	Strongly regulated	Impounded river section	Name of impoundment
River section ***from rkm-rkm***	***from rkm-rkm***	**Canalized; artificial bank, dike line along main river bed** ***from rkm-rkm***	**Length of impoundment** ***from rkm – rkm***	**e.g. dam or reservoir**
MORAVA Czech territory		69 – 108		
	109 – 121		115.2 – 123.7	*HODONIN*
		121 – 221	135.6 – 141.6	*VNOROVY*
			141.6 – 146.8	*VESELI*
			169.7 – 178.6	*SPYTHNEV*
			179.6 – 189.2	*BELOV*
			195.9 – 204.1	*KROMERIZ*
	221 – 230	Short reaches regulated (0 -4km)	221.0 – 225.9	*BOLELOUC*
		230 – 243	233.6 – 241.7	*OLOMOUC*
	243 – 260			
	260 - 328	Short reaches regulated (0 - 4 km)	262.1 – 265.1	*LITOVEL*
		328 – 336		
	336 – 347			
		347 – 353		
	353 - 354			
DYJE Czech territory	0 -18	Short reaches regulated (0 -3 km)		
	18 - 22			
		22 – 46		
			46 – 53	Nove Mlyny 1
			53 – 58	N. Mlyny II
			58 – 67	N.Mlyny III
		64 – 97		
	97 - 99			
		99-109		

Name	**Free-flowing section**	**Strongly regulated**	**Impounded river section**	**Name of impoundment**
River section ***from rkm-rkm***	***from rkm-rkm***	**Canalized; artificial bank, dike line along main river bed** ***from rkm-rkm***	**Length of impoundment** ***from rkm – rkm***	**e.g. dam or reservoir**
	109 - 131			
			132 – 138	Znojmo
		138 - 174		
			174 –204	Vranov
	204 - 210			
Svratka	0 – 3			Backwater of Nove Mlyny I. reservoir
		3 – 10		
	10 - 15			
		15 – 18		
	18 – 28	Short reaches regulated (0 -1 km)		
		28 – 42		
	42 – 54			
		54 – 56		
			56 – 66	Brno
	67 - 112	Short reaches regulated (0 -2 km)		
			112 – 113	VIR II
			112 – 125	VIR I
	125 - 165			
		165 – 167		
	167 - 174			

SLOVAK REPUBLIC

Name	Free-flowing section	Regulated/ canalised	Impounded river section	Name*
River section ***Rkm-rkm***	***rkm-rkm***	**artificial bank, dyke line along main river bed etc.)** ***rkm-rkm***	**Storage volume (*mil. m³*)** ***rkm – rkm***	**of dam, polder or reservoir** ***at rkm***
DANUBE 1,880 - 1,700		Dyke lines along the left river bank	35 mil. m³ 41 km	*Cunovo Gabcikovo*
MORAVA 0 - 106		Regulated, dyke lines locally along or near the whole river	/	/
VAH 0 – 367,5		Dyke Lines along the whole river	rkm 336,3 – 345 320,1 Mil. m³	*Liptovska Mara*
			rkm 333,2 – 336,2 7,33 Mil. m³,	*Bešeňová*
			rkm 294,3 – 301,3 4,4 Mil. m³	*Krpeľany*
			rkm 256,8 – 264,3 8,07 Mil. m³,	*Žilina*
			rkm 247,1 –253,1 6,4 Mil. (2,53 km² flooded area)	*Hricov*
			rkm 209,2 – 221,2 24 Mil. (5,7km² flooded area)	*Nosice*
			rkm 201,4 203,0 2,0 Mil. (0,5 km² flooded area)	*Dolne Kockovce*
(Cierny Vah – trib.of Vah)			rkm 11,5 3,7 mil. m³,	*Cierny Vah*
			rkm 163,1 –165,0 1,8 Mil. (0.9km²)	*Trencianske Biskupice*
			rkm 114,6 – 120,4 3,9 Mil. (4,3 m²)	*Slinava*
			rkm 64,0-76,0 20,4 Mil. (11,7 km²)	*Kralova*

Name	**Free-flowing section**	**Regulated/ canalised**	**Impounded river section**	**Name***
River section ***Rkm-rkm***	***rkm-rkm***	**artificial bank, dyke line along main river bed etc.)** ***rkm-rkm***	**Storage volume (*mil. m³*)** ***rkm – rkm***	**of dam, polder or reservoir** ***at rkm***
			rkm 44,9 –54,0 6,5 mill. m³,	*Selice*
HRON **0 - 278**		0-15		
	15-16			
		16-17		
	17-35			
		35-37		
	37-39			
		39-40		
	40-44			
		44-45		
	45-47			
		47-48		
	48-53			
		53-58		
	58-63			
		63-64		
	64-69			
		69-74	rkm 73,5 – 76,1 2,0 Mil. (1,48 km²)	*Vel'ké Kozmalovce*
	74-76			
		76-78		
	78-80			
		80-84		
	84- 94			
		94-95		
	95-99			
		99-100		
	100-130			
		130-134		

Name	**Free-flowing section**	**Regulated/ canalised**	**Impounded river section**	**Name***
River section ***Rkm-rkm***	***rkm-rkm***	**artificial bank, dyke line along main river bed etc.)** ***rkm-rkm***	**Storage volume (*mil. m³*)** ***rkm – rkm***	**of dam, polder or reservoir** ***at rkm***
	134-136			
		136-144		
	144-153			
		153-162		
	162-167			
		167-170		
	170-172			
		172-176		
	176-179			
		179-184		
	184-189			
		189-190		
	190-191			
		191-193		
	193-195			
		195-196		
	196-198			
		198-199		
	199-202			
		202-205		
	205-210			
		210-214		
	214-215			
		215-224		
	224-225			
		225-226		
	226-230			
		230-231		
	231-243			
		243-245		
	245-276			

Name	**Free-flowing section**	**Regulated/ canalised**	**Impounded river section**	**Name***
River section ***Rkm-rkm***	***rkm-rkm***	**artificial bank, dyke line along main river bed etc.)** ***rkm-rkm***	**Storage volume (*mil. m³*)** ***rkm – rkm***	**of dam, polder or reservoir** ***at rkm***
		276-277		
	277-278			
HORNAD **0 - 179**	0 - 13			
		13-22		
	13-24			
		24-40		
	40-66			
			rkm 66,3 – 70,7 2,45 mil. m³,	*Mala Lodina*
			rkm 70,7 –85,3 43,53 mil. m³	*Ruzín*
	86-86			
		86-87		
	87-92			
		92-93		
	93-94			
		94-95		
	95-97			
		97-99		
	99-100			
		100-101		
	101-107			
		107-112		
	112-130			
		130-135		
	135-154			
		154-155		
	155-173			
		173.174		
	174-179			

Name	**Free-flowing section**	**Regulated/ canalised**	**Impounded river section**	**Name***
River section ***Rkm-rkm***	***rkm-rkm***	**artificial bank, dyke line along main river bed etc.)** ***rkm-rkm***	**Storage volume (*mil. m³*)** ***rkm – rkm***	**of dam, polder or reservoir** ***at rkm***
BODROG 0 - 15		Dyke Lines along Bodrog 0 - 15		
LATORICA 0 - 31		0 - 31		
LABOREC 0 - 131		0 - 43		
			53,0 mil.m³	*Besa*
	43 - 45			
			rkm 45 (inlet) (Siravsky kana; 177,0 Mil m^3, rkm 37,1 (outlet)	Zemplínska Šírava
		45 -48		
	48 - 56			
		56 - 59		
	59 - 65			
		65 - 68		
	68 - 83			
		83 - 84		
	84 - 93			
		93 - 94		
	94 - 96			
		96 - 97		
	97 - 100			
		100 - 101		
	101 - 108			
		108 - 112		
	112 - 116			
		116 - 117		
	117 - 119			
		119 - 121		
	121 - 130			

Name	Free-flowing section	Regulated/ canalised	Impounded river section	Name*
River section ***Rkm-rkm***	***rkm-rkm***	**artificial bank, dyke line along main river bed etc.)** ***rkm-rkm***	**Storage volume (*mil. m³*)** ***rkm – rkm***	**of dam, polder or reservoir** ***at rkm***
ONDAVA 0 - 149		0 - 41		
	41 - 47			
		47 - 54		
			rkm 67,5 – 72,6 0,9 mil.m³	Mala Domasa
			rkm 72,6 – 91,5 136,6.mil.m³	*Velka Domasa*
	91,5 - 96			
		96 - 97		
	97 - 99			
		99 - 103		
	103 - 106			
		106 - 107		
	107 - 115			
		115 - 119		
	119 - 124			
		124 - 125		
	125 - 131			
		131 - 132		
	132 - 135			
		135 - 138		
	138 - 149			
IPEL rkm 0 - 198	0 - 8			
		8 – 179,8		

Name	Free-flowing section	Regulated/ canalised	Impounded river section	Name*
River section *Rkm-rkm*	***rkm-rkm***	**artificial bank, dyke line along main river bed etc.) *rkm-rkm***	**Storage volume (*mil. m³*) *rkm – rkm***	**of dam, polder or reservoir *at rkm***
			179,8 – 184,0 23,7 Mil. (1,38 km²)	*Malinec*
	184 - 189			
		189 - 193		
	193 - 198			
NITRA 0 - 168		0 – 134 r		
	134 - 138			
		138 - 140		
	140 – 142			
		142 – 145		
	145 - 151			
		151 – 155		
	155 - 168			
SLANA 0 - 93		0 - 56		
	56 -60			
		60 - 62		
	62 - 66			
		66 - 69		
	69 - 76			
		76 - 78		
	78 - 93			

* also: Bukovec (10-50 mil.m³), Pod Bukovcom (1-10 m³), Hrhov (1-10 mill m³), Palcmanská Masa (10-50 mill.m³), Teply Vrch (1-10 mill m³), Klenovec (1-10 mill m³), Luborec (1-10 mill m³), Orava (300 mil.m³), Nova Bystrica (27 mil.m³), Ruzina (14 mil.m³), Turcek (9,1 mil.m³), Hrinova (7,1 mil.m³), Nitrianske Rudno (3,2 mil.m³), Starina (45,1 mil.m³), Zemplínska Sirava (177 mil.m³).

HUNGARY

Name	**Free-flowing section**	**Strongly regulated**	**Impounded river section**	**Name of impoundment**
River section ***from rkm - rkm***	***from rkm - rkm***	**Canalized; artificial bank, dike line along main river bed etc.)** ***from rkm - rkm***	**Length of impoundment** ***from rkm - rkm***	**e.g. dam for power generation, or reservoir for water supply**
DANUBE **417 km 1433.2-1850.2 rkm**	417 km	Country border-Dunakiliti, dams/weirs, hydropower, flood protection 1835-1850 rkm		
		Gönyü-Esztergom navigation, flood protection, urbanisation, bank reinforcement, 1719-1788 rkm		
		Budapest Nord-Halásztelek, navigation, flood protection, urbanisation, bank reinforcement, 1622-1657 rkm		
		Soroksári-Duna, hydropower, urbanisation, dams/weirs, 0-57 rkm		
RABA **0-187.6 rkm**				
		country border- Szentgotthárd hydropower, flood protection, urbanisation, straightening, bank reinforcement, 216-203 rkm		
	104.68-203 rkm			
	0-68.25 rkm	Ikervár üzemcsatorna kezdete/Beginning of the diversion canal, Ikervár - Mosoni Duna hydropower, flood protection, dams/weirs, bank reinforcement, 0-100.68 rkm	100.68-104.68 rkm	*Ikervár*
			68.25-73.3 rkm	*Nick*
RÉPCE-RABCA **0-70 rkm**				
	70 rkm	spillway-Mosoni-Duna flood protection, staightening, bank reinforcement, 0-70 rkm		
IPOLY/ IPEL **0-133 rkm**	133 rkm			

Name	Free-flowing section	Strongly regulated	Impounded river section	Name of impoundment
River section *from rkm - rkm*	*from rkm - rkm*	**Canalized; artificial bank, dike line along main river bed etc.)** ***from rkm - rkm***	**Length of impoundment** ***from rkm - rkm***	**e.g. dam for power generation, or reservoir for water supply**
SIÒ 0-121 rkm	121 rkm	navigation, flood protection, dams/weirs straightening, bank protection, 0-120 rkm		
DRAVA 0-237 rkm	237 rkm			
TISZA 585.25 159.6-744.85 rkm				
	544-744.85 rkm	Dombrád-Tiszalök hydropower, navigation, flood protection, dams/weirs, bank reinforcement, straightening, 518.2-593 rkm	518.2-593 rkm	*Tiszalök (518.2 rkm)*
		Tiszalök- Kiskörei-víztározó, hydropower, navigation, flood protection, straightening, bank reinforcement, 440-516 rkm		
		Kiskörei-víztározó/ Kisköre reservoir hydropower, navigation, flood protection, dams/weirs, straightening, 403-440 rkm	403-440	*Kisköre 403*
		Kiskörei-tározó, river bays hydropower,flood protection dams/weirs, bank reinforcement, 403-440		
	180-403 rkm	Kisköre-Szolnok, hydropower, navigation, flood protection, urbanisation, straightening, bank reinforcement, 335-403 rkm		
		Szeged-country border hydropower, navigation, flood protection, urbanisation, dams/weirs, straightening, bank reinforcement, 160-180 rkm	180-	*YU*
SZAMOS 0-50 rkm				
	50 rkm	flood protection/ straightening, bank reinforcement, 0-50 rkm		
BODROG 0-51 rkm	51 rkm	flood protection, staightening, bank reinforcement, 0-51 rkm	0-37 rkm	Tiszalök (518.2 rkm)

Name	Free-flowing section	Strongly regulated	Impounded river section	Name of impoundment
River section ***from rkm - rkm***	***from rkm - rkm***	**Canalized; artificial bank, dike line along main river bed etc.)** ***from rkm - rkm***	**Length of impoundment** ***from rkm - rkm***	**e.g. dam for power generation, or reservoir for water supply**
SAJÓ 0-125 rkm	125 rkm			
		Bódva mouth-Tisza river flood protection, staightening, bank reinforcement, 0-69 rkm		
HERNAD 0-118 rkm			7.27-13.55 rkm	*Kesznyeten*
			13.55-21 rkm	*Bőcs*
			54.3-62 rkm	*Felsödobsza*
			65.9-73 rkm	*Gibart*
			93.23-95.5 rkm	*Hernádszurdok*
ZAGYVA 0-180 rkm	169-180 rkm			
		Mátraverebély-Szolnok flood protection, urbanisation, dams/weirs, straightening, bank reinforcement, 0-169 rkm	152.73-154.15	*Maconka*
			145.95-147.75	*Mátraverebély*
HÁRMAS-KÖRÖS 0-91 rkm	0-47.5 rkm			
		hydropower, flood protection, dams/weirs, straightening, bank reinforcement, 0-91.27 rkm	47.5-91.27 rkm	*Békésszentandrás*
BERETTYO 0-74 rkm	0-74 rkm		0-22.1 rkm	*Körösladány*
HORTOBAGY-BERETTYO 0-79 rkm	79 rkm	Hortobagy-főcsatorna - Hármas-Körös flood protection, dams/weirs, straightening, bank reinforcement, 79-0 rkm	0-45.55 rkm	*Békésszentandrás*
SEBES KÖRÖS 0-59 rkm		country border-Hármas-Körösflood protection, staightening, bank reinforcement, 0-59 rkm	0-13.7 rkm	*Békésszentandrás*
			13.7-30.1 rkm	*Körösladány*
KETTOS KÖRÖS 0-37 rkm			0-26.31 rkm	*Békésszentandrás*
			26.31-37.26 rkm	*Békés*
FEKETE KÖRÖS 0-20 rkm			0-20.49 rkm	*Békés*

Name	Free-flowing section	Strongly regulated	Impounded river section	Name of impoundment
River section ***from rkm - rkm***	***from rkm - rkm***	**Canalized; artificial bank, dike line along main river bed etc.)** ***from rkm - rkm***	**Length of impoundment** ***from rkm - rkm***	**e.g. dam for power generation, or reservoir for water supply**
FEHER KÖRÖS			0-7.32 rkm	Békés
0-10 rkm			7.32-9.78 rkm	Gyula
MAROS	50 rkm			
0-50 rkm				

SLOVENIA

Name	Free-flowing section	Regulated/ canalized	Impounded river section	Name
River section ***rkm-rkm***	***rkm-rkm***	**artificial bank, dyke line along main river bed etc.** ***rkm-rkm***	**Storage volume (*mil. m³*)** ***rkm – rkm***	**of dam, polder or reservoir** ***at rkm***
SAVA			Total (available) rkm	
			6,2 (3,2) 907 - 912	*Moste*
			10,7 (1,7) 857 - 864	*Mavcice*
			3,1 (1,1) 853 - 857	*Medvode*
			8,6 (1.4) 767 -778	*Vrhovo*
			7 (1) 758 - 767	*Bostanj*
Drava	0	142	Total (available) rkm	
			5,6 (1,034) - 451	*Dravograd*
			7,1 (1,599) - 439	*Vuzenica*
			10,3 (1,563) - 426	*Vuhred*
			10,5 (1,351) - 414	*Ozbalt*
			4,2 (0,542) - 405	*Fala*
			13,1 (2,206) - 390	*Mariborski Otok*
			4,3 (0,181) - 383	*Zlatoličje*
			17,1 (3,929) - 349	*Formin*
Mura				

CROATIA

Name	Free-flowing section	Strongly regulated	Impounded river section	Name of impoundment
River section ***from rkm - rkm***	***from rkm - rkm***	**Canalized; artificial bank, dike line along main river bed etc.)** ***from rkm - rkm***	**Length of impoundment** ***from rkm - rkm***	**e.g. dam for power generation, or reservoir for water supply**
DANUBE 1.433–1.295	1.433-1.295	in total about 45 km right bank dykes along the Danube mainly upstream of the Drava mouth and about 36 km impoundment dykes along the tributary Baranjska Karašica; international navigable waterway (138 km); not strongly regulated	-	-
SAVA 725-207	725-705 698-207	in total about 566 km left and right bank dykes on Croatian territory;international navigable waterway downstream of Sisak (376 km); not strongly regulated	705-698	Sills near Zagreb Cogeneration Plant for enabling cooling water
DRAVA 323-0	242-0	in total about 307 km left and right bank dykes on Croatian territory; international navigable waterway downstream of Osijek (15 km); not strongly regulated downstream of the Mura mouth	323-242	Chain of the three derivative type HPPs upstream of the Mura mouth: Varazdin HPP (reservoir of 7,4 mil. m^3), Cakovec HPP (reservoir of 51,0 mil. m^3), and Dubrava HPP (reservoir of 93,5 mil. m^3)
MURA 79-0	79-0	in total about 40 km right bank dykes along the Mura and about 7 km impoundment dykes along the tributary Trnava; not strongly regulated	-	-
KUPA 294-0	294-165 162-0	in total about 38 km left and right bank dykes; not strongly regulated	165-162	Ozalj HPP (reservoir of 1,4 mil. m^3)
UNA 212-153 70-0	212-153 70-0	in total about 20 km left bank dykes on the downstreammost section of the river; not strongly regulated	-	-

SERBIA AND MONTENEGRO

Name	Free-flowing section	Regulated/canalized	Impounded river section	Name
River section *rkm-rkm*	***rkm-rkm***	**artificial bank, dyke line along main river bed etc.; *rkm-rkm***	**Storage volume (*mil. m³*); *rkm – rkm***	**of dam, polder or reservoir *at rkm***
Danube		Reservoir	2550 Mil . m³	Iron Gate I
		Barrage, weir	868 Mil . m³	Iron Gate II
		Diversion works, intakes		Dunav-Tisa-Dunav
				Thermal Power Plant "Kostolac A" Intake
				Thermal Power Plant "Kostolac B" Intake
		Dikes:		
		Danube Left bank: State border - Bogojevo	km 1433 - km 1367.5	
		Danube Left bank: Bogojevo - Novi Sad	km 1367.5 - km 1260	
		Danube Left bank: Novi Sad - mouth of the Tisa river	km 1260 – km 1215	
		Danube Left bank: Mouth of the Tisa river	km 1215 – km 1208	
		Danube Left bank: Pancevo	km 1208 – km 1154	
		Danube Left bank: Pancevo	km 1154 - km 1086	
		Danube Right bank: S. Karlovci ((Petrovaradin	km 1270 - km 1243	
		Danube Right bank: Smederevo (mouth of the Morava river (	km 1116 - km 1105	
		Danube Right bank: Mouth of the Morava river	km 1105 - km 1048	
		Danube Right bank:	km 943 - km 847	
Tisa		Barrage, weir	229 Mil . m³	Tisa
		Dikes:		
		Tisza Left bank State border - mouth	km161+000 - km 0+000	
		Tisza Right bank State border mouth	km161+000 - km 0+000	
Timis		Dikes:		
		Timis Left bank Upstream of Hydrosistem DTD	km 115 - km 81	
		Timis Right bank Upstream of Hydrosistem DTD	km 115 - km 81	
		Hydrosystem DTD		
Sava		Diversion works, intakes		Thermal Power Plant "TENT A" Intake

Name	Free-flowing section	Regulated/canalized	Impounded river section	Name
River section *rkm-rkm*	***rkm-rkm***	**artificial bank, dyke line along main river bed etc.; *rkm-rkm***	**Storage volume (*mil. m³*); *rkm – rkm***	**of dam, polder or reservoir *at rkm***
				Thermal Power Plant "TENT B" Intake
				Water Plant "Makiš" Intake
		Dikes:		
		Sava Left bank: state border mouth	km 209+800 - km 0+000	
		Sava Right bank: mouth of the Drina river - mouth	km 177+000 - km 0+000	
Drina		Reservoir	89 Mil . m³	Zvornik
		Reservoir	340 Mil . m³	Bajina Bašta
		Dike Drina Right bank		
Morava		Dikes:		
		Morava Left bank		
		Morava Right bank		
		South Morava Left bank		
		South Morava Right bank		
		West Morava Left bank		
		West Morava Right bank		
Zapadna Morava		Reservoir	18 Mil . m³	Međuvršje
		Barrage, weir	3 Mil . m³	Ovčar Banja
Timok		Dikes:		
		Timok Right bank		
		Timok Left bank		
Lim		Reservoir	44 Mil . m³	**Potpeć**
Ibar		Reservoir	370 Mil . m³	**Gazivode**

BULGARIA

Name	Free-flowing section	Strongly regulated	Impounded river section	Name of impoundment
Riversection *rkm - rkm*	***from rkm - rkm***	**Canalized; artificial bank, dike line along main river bed etc.) *from rkm - rkm***	**Length of impoundment *from rkm - rkm***	**e.g. dam for power generation, or reservoir for water supply**

Name	Free-flowing section	Strongly regulated	Impounded river section	Name of impoundment
Riversection ***rkm - rkm***	***from rkm - rkm***	**Canalized; artificial bank, dike line along main river bed etc.)** ***from rkm - rkm***	**Length of impoundment** ***from rkm - rkm***	**e.g. dam for power generation, or reservoir for water supply**
DANUBE rkm 845,5-375,5	The “Iron Gate” I at km 942.95 and “Iron Gate” II at km 863.00 upstream the BG reach (845 - 375) have a big influence on the entire hydraulic and sediment regime as well as on the biodiversity of the aquatic ecosystem. Unsteady flow as a result of specific dam operation for power production causes severe bottom and bank erosion. The natural river flow is strongly disturbed[1].			*Nikopol-Turnu Magurele*
	845,5 - 810			
		810 - 808.5		
	808.5 - 804			
		804 - 802		
		791 - 790		
		776.8 - 775.3		
		742.4 - 744		
		742 – 740		
ISKAR 0-368				
			264 – 267; 6.7 mil m³	*Pancharevo reservoir – flood protection and recreation*
			299 – 308; 655 mil m³	*Iskar reservoir – water supply*
OGOSTA Rkm 0-144				
			80 – 91; 506 mil m³	*Ogosta reservoir – originally built for irrigation, today used for recreation*
YANTRA Rkm 0-286				

[1] *regulated BG banks (longer than 1 km): at km 810 - 808.5, at km 804 - 802, at km 791 - 790, at km 776.8 - 775.3, at km 742.4 - 744, at km 742 – 140 km, at km 678 – 320 + 5,900 m, at km 607.5 - 550 + 6,600 m, at km 597.5 - 100 + 3,000 m, at km 558.6 - 200 + 1,500 m ,at km 554.65 - 553.7 - 950 m, at km 520 - 516 - 4,000 m; at km 497 - 496 – 1,900 m, at km 99 - 498 – 1,000 m, at km 497.6 - 494, at km 490 - 489 – 1 km, at km 485 - 484 - 1 km, at km 486 - 482, at km 389.6 - 399.4 – 1,200 m, at km 382 - 380 – 2,000 m, at km 379 - 375.5 - 250 + 3,250 m. *All lowlands on the Danube Bulgarian terrace are protected by dikes and levees.*

ROMANIA

Name	Free flowing section	Strongly regulated	Impounded river section	Name of impoundment
River section ***from rkm - rkm***	***from rkm - rkm***	**Canalized; artificial bank, dike line along main river bed etc.)** ***from rkm - rkm***	**Length of impoundment** ***from rkm - rkm***	**e.g. dam for power generation, or reservoir for water supply**
Danube				
943-863_Left	-	-	943-863	Iron Gate II, 943-863 km
863-854_Left	863-854	-		
854-845_Left	-	854-845		
845-824_Left	845-824	-		
824-815_Left	-	824-815		
815-811_Left	815-811	-		
811-805_Left	-	811-805		
805-782_Left	805-782	-		
782-778_Left	-	782-778		
778-744_Left	778-744	-		
744-680_Left	-	744-680		
680-665_Left	680-665	-		
665-632_Left	-	665-632		
632-630_Left	632-630	-		
630-628_Left	-	630-628		
628-604_Left	628-604	-		
604-182,5_Left	-	604-182,5		
182,5-181_Left	182,5-181	-		
181-178_Left	-	181-178		
178-176_Left	178-176	-		
176-174_Left	-	176-174		
174-167_Left	174-167	-		
167-155_Left	-	167-155		
155-134_Left	-	155-134		
375,5-358_Right	375,5-358	-		
358-355_Right	-	358-355		
355-340,5 Right	355-340,5	-		

Name	**Free flowing section**	**Strongly regulated**	**Impounded river section**	**Name of impoundment**
River section ***from rkm - rkm***	***from rkm - rkm***	**Canalized; artificial bank, dike line along main river bed etc.)** ***from rkm - rkm***	**Length of impoundment** ***from rkm - rkm***	**e.g. dam for power generation, or reservoir for water supply**
340,5-335,5 Right	-	340,5-335,5		
335,5-329 Right	335,5-329	-		
329-327_Right	-	329-327		
327-319_Right	327-319	-		
319-315_Right	-	319-315		
315-296_Right	315-296	-		
296-295_Right	-	296-295		
295-287_Right	295-287	-		
287-282_Right	-	287-282		
282-271_Right	282-271	-		
271-265_Right	-	271-265		
265-249_Right	265-249	-		
249-237_Right	-	249-237		
237-169_Right	-	237-169		
237-169 Macin arm	-	237-169		
169-106_Right		169-106		
106-81_Right	106-81	-		
81-63 Tulcea arm	-	81-63		
63-39 Sulina arm	-	63-39		
39-34,6 Sulina arm	39-34,6	-		
34,6-15 Sulina arm	-	34,6-15		
15-3,7 Sulina arm	15-3,7	-		
3,7-0 Sulina arm	-	3,7-0		
63-30 Sf. Gheorghe arm	-	63-30		
30-5 Sf. Gheorghe arm	30-5	-		
5-3 Sf. Gheorghe arm	-	5-3		
3-0 Sf. Gheorghe arm	3-0	-		

Name	Free flowing section	Strongly regulated	Impounded river section	Name of impoundment
River section ***from rkm - rkm***	***from rkm - rkm***	**Canalized; artificial bank, dike line along main river bed etc.)** ***from rkm - rkm***	**Length of impoundment** ***from rkm - rkm***	**e.g. dam for power generation, or reservoir for water supply**
81-75 Chilia arm_Right	81-75	-		
75-32 Chilia arm_Right	-	75-32		
32-9 Chilia arm_Right	32-9	-		
9-0 Chilia arm_Right	-	9-0		
Danube-Black Sea Canal	-	-	total	
Tisa				
659-642	659-642		-	
642-604	–	642-604	-	
604-598	604-598		-	
Somesul Mic				
178-161	178-161			
161-153			161-153	Fantanele reservoir for power generation
153-135	153-135			
135-130			135-130	Tarnita and Somes Cald reservoirs for power generation
130-127			130-127	Gilau reservoir for water supply and power generation
127-120	127-120			
120-119		120-119		
119-96	119-96			
96-92		96-92		
92-87	92-87			
87-72		87-72		
72-70	72-70			
70-68		70-68		
68-65	68-65			

Name	Free flowing section	Strongly regulated	Impounded river section	Name of impoundment
River section ***from rkm - rkm***	***from rkm - rkm***	**Canalized; artificial bank, dike line along main river bed etc.)** ***from rkm - rkm***	**Length of impoundment** ***from rkm - rkm***	**e.g. dam for power generation, or reservoir for water supply**
65-64		65-64		
64-55	64-55			
55-52		55-52		
52-48	52-48			
48-47		48-47		
47-37	47-37			
37-33		37-33		
33-27	33-27			
27-18		27-18		
18-12	18-12			
12-3		12-3		
3-0	3-0			
Somes				
427-396	427-396		-	
396-395		396-395	-	
395-386	395-386		-	
386-385		386-385	-	
385-381	385-381		-	
381-380		381-380	-	
380-378	380-378		-	
378-377		378-377	-	
377-369	377-369		-	
369-367		369-367	-	
367-365	367-365		-	
365-362		365-362	-	
362-359	362-359		-	
359-356		359-356	-	
356-355	356-355		-	
355-354		355-354	-	
354-351	354-351		-	
351-343		351-343	-	

Name	**Free flowing section**	**Strongly regulated**	**Impounded river section**	**Name of impoundment**
River section ***from rkm - rkm***	***from rkm - rkm***	**Canalized; artificial bank, dike line along main river bed etc.)** ***from rkm - rkm***	**Length of impoundment** ***from rkm - rkm***	**e.g. dam for power generation, or reservoir for water supply**
343-341	343-341		-	
341-340		341-340	-	
340-332	340-332		-	
332-323		332-323	-	
323-322	323-322		-	
322-321		322-321	-	
321-302	321-302		-	
302-297		302-297	-	
297-292	297-292		-	
292-290		292-290	-	
290-286	290-286		-	
286-285		286-285	-	
285-281	285-281		-	
281-277		281-277	-	
277-275	277-275		-	
275-270		275-270		
270-202	270-202			
202-196		202-196		
196-168	196-168			
168-156		168-156		
156-154	156-154			
154-153		154-153		
153-152	153-152			
152-151		152-151		
151-149	151-149			
149-146		149-146		
146-141	146-141			
141-140		141-140		
140-137	140-137			
137-136		137-136		
136-135	136-135			

Name	Free flowing section	Strongly regulated	Impounded river section	Name of impoundment
River section ***from rkm - rkm***	***from rkm - rkm***	**Canalized; artificial bank, dike line along main river bed etc.)** ***from rkm - rkm***	**Length of impoundment** ***from rkm - rkm***	**e.g. dam for power generation, or reservoir for water supply**
135-129		135-129		
129-126	129-126			
126-125		126-125		
125-121	125-121			
121-119		121-119		
119-118	119-118			
118-51		118-51		
Crisul Alb				
244.0 - 221	244 - 221	-	-	
221.0 – 218.0	-	-	221.0 – 218.0	Mihaileni (dam under constr,)
218.0 – 216.0	218.0 – 216.0	-	-	
216.0 – 214.0	-	216.0 – 214.0	-	
214.0 – 210.4	214.0 – 210.4	-	-	
210.4 – 198.3	-	210.4 – 198.3	-	
198.3 – 148.9	198.3 – 148.9	-	-	
148.9 – 141.4	-	148.9 – 141.4	-	
141.4 – 130.5	141.4 – 130.5	-	-	
130.5 – 129.7	-	130.5 – 129.7	-	
129.7 – 108.5	129.7 – 108.5	-	-	
108.5 – 103.4	-	108.5 – 103.4	-	
103.4 – 76.9	103.4 – 76.9	-	-	
76.9 – 10.0	-	76.9 - 10	-	
Crisul Negru				
180 - 164.1	180 - 164.1	-	-	
164.1 - 159	-	164.1 - 159	-	
159 - 147	159 - 147	-	-	
147 - 144.5	-	147 - 144.5	-	
144.5 - 138	144.5 - 138	-	-	
138 - 117	-	138 - 117	-	
117 - 63	117 - 63	-	-	
63 - 16	-	63 - 16	-	

Name	**Free flowing section**	**Strongly regulated**	**Impounded river section**	**Name of impoundment**
River section *from rkm - rkm*	***from rkm - rkm***	**Canalized; artificial bank, dike line along main river bed etc.) *from rkm - rkm***	**Length of impoundment *from rkm - rkm***	**e.g. dam for power generation, or reservoir for water supply**
Crisul Repede				
230 - 206	-	230 - 206	-	
206 - 181.4	206 - 181.4	-	-	
181.4 - 180.6	-	181.4 - 180.6	-	
180.6 - 162.7	180.6 - 162.7	-	-	
162.7 - 161.2	-	162.7 - 161.2	-	
161.2 - 140.7	161.2 - 140.7	-	-	
140.7 - 138	-	140.7 - 138	-	
138 - 123.5	-	-	138 - 123.5	Ac.Lugasu si ac.Tileagd
123.5 - 59	-	123.5 - 59	-	
Barcau				
208 - 168	208 - 168	-	-	
168 - 163.6	-	168 - 163.6	-	
163.6 - 142	163.6 - 142	-	-	
142 - 74	-	142 - 74	-	
Bega				
243-214	243-214	-	-	
214-150	-	214-150	-	
150-149	-	-	150-149	Topolovat weir
149-137	149-137	-	-	
137-127	-	137-127	-	
124-118	-	-	124-118	UHE Timisoara weir
118-73	-	118-73	-	
Timis				
339-335	339-335	-	-	
335-333	-	-	335-333	Trei Ape Reservoir
333-281	333-281	-	-	
281-277	-	281-277	-	
277-225	277-225	-	-	
225-208	-	225-208	-	
208-207	-	-	208-207	Costei sill

Name	Free flowing section	Strongly regulated	Impounded river section	Name of impoundment
River section ***from rkm - rkm***	***from rkm - rkm***	**Canalized; artificial bank, dike line along main river bed etc.)** ***from rkm - rkm***	**Length of impoundment** ***from rkm - rkm***	**e.g. dam for power generation, or reservoir for water supply**
207-103	-	207-103	-	
103-99	-	-	103-99	Tomasevat weir **– *in SM Republic***
Tarnava Mare				
246-220,9	246-220,9			
220,9-219,5			220,9-219,5	Zetea dam
219,5-200,2	219,5-200,2			
200,2-179,4		200,2-179,4		
179,4-155,8	179,4-155,8			
155,8-144,5		155,8-144,5	155,8-144,5	Vanatori Intake dam
144,5-144,3		144,5-144,3	144,5-144,3	Albesti Intake dam
144,3-140,07	144,3-140,07			
140,07-127,57		140,07-127,57		
127,57-113,65	127,57-113,65			
113,65-104,35		113,65-104,35		
104,35-95,33	104,35-95,33			
95,33-94,01		95,33-94,01		
94,01-79,24	94,01-79,24			
79,24-73,04		79,24-73,04		
73,04-71,54	73,04-71,54			
71,54-62,5		71,54-62,5		
62,5-62,2		62,5-62,2	62,5-62,2	Copsa Mica Intake dam
62,2-61,34		62,2-61,34		
61,34-53,6	61,34-53,6			
53,6-50,76		53,6-50,76		
50,76-30,43	50,76-30,43			
30,43-22,44		30,43-22,44		
22,44-8,94	22,44-8,94			
8,94-5,74		8,94-5,74		
5,74-0				
Mures				
789-775.8	789-775.8			

Name	Free flowing section	Strongly regulated	Impounded river section	Name of impoundment
River section ***from rkm - rkm***	***from rkm - rkm***	**Canalized; artificial bank, dike line along main river bed etc.)** ***from rkm - rkm***	**Length of impoundment** ***from rkm - rkm***	**e.g. dam for power generation, or reservoir for water supply**
775.8-746.8		775.8-746.8		
746.8-653.4	746.8-653.4			
653.4-651.4		653.4-651.4		
651.4-634.4	651.4-634.4			
634.4-624.9		634.4-624.9		
624.9-597	624.9-597			
597-595.5		597-595.5	595.5-595	Târgu Mureş1 Intake dam
595-589.2		595-589.2	589.2-588.5	Târgu Mureş2 Intake dam
588.5-587		588.5-587		
587-551,5	587-551.5			
551.5-551			551.5-551	Cipau Intake dam
551-539	551-539			
539-538.5			539-538.5	Iernut Intake dam
538.5-515	538.5-515			
515-508		515-508		
508-472.5	508-472.5			
472.5-470.8		472.5-470.8		
470.8-469	470.8-469			
469-464.5		469-464.5		
464.5-437.7	464.5-437.7			
437.7-434.7		437.7-434.7		
434.7-400.2	434.7-400.2			
400.2-398.7		400.2-398.7		
398.7-397	398.7-397			
397-390.6		397-390.6		
390.6-382.5	390.6-382.5			
382.5-378.6		382.5-378.6		
378.6-377.5	378.6-377.5			
377.5-372.5		377.5-372.5		
372.5-371.5	372.5-371.5			
371.5-362.9		371.5-362.9		

Name	Free flowing section	Strongly regulated	Impounded river section	Name of impoundment
River section ***from rkm - rkm***	***from rkm - rkm***	**Canalized; artificial bank, dike line along main river bed etc.)** ***from rkm - rkm***	**Length of impoundment** ***from rkm - rkm***	**e.g. dam for power generation, or reservoir for water supply**
362.9-358.9	362.9-358.9			
358.9-342.01		358.9-342.01		
342.01-338.1	342.01-338.1			
338.1-335.1		338.1-335.1		
335.1-333.8	335.1-333.8			
333.8-332.3		333.8-332.3		
332.3-328.2	332.3-328.2			
328.2-325.5		328.2-325.5		
325.5-318.9	325.5-318.9			
318.9-316.8		318.9-316.8		
316.8-311.78	316.8-311.78			
311.78-310.4		311.78-310.4		
310.4-310	310.4-310			
310-301.6		310-301.6		
301.6-299	301.6-299			
299-297.5			299-297.5	Mintia Intake dam
297.5-295.5	297.5-295.5			
295.5-292.7		295.5-292.7		
292.7-280	292.7-280			
280-273.01		280-273.01		
273.01-272	273.01-272			
272-267.1		272-267.1		
267.1-266.7	267.1-266.7			
266.7-262		266.7-262		
262-253.2	262-253.2			
253.2-248.7		253.2-248.7		
248.7-183.66	248.7-183.66			
183.66-181.03		183.66-181.03		
181.03-171.5	181.03-171.5			
171.5-164.06		171.5-164.06		
164.06-163.4	164.06-163.4			

Name	Free flowing section	Strongly regulated	Impounded river section	Name of impoundment
River section ***from rkm - rkm***	***from rkm - rkm***	**Canalized; artificial bank, dike line along main river bed etc.)** ***from rkm - rkm***	**Length of impoundment** ***from rkm - rkm***	**e.g. dam for power generation, or reservoir for water supply**
163.4-159.4		163.4-159.4		
159.4-151.7	159.4-151.7			
151.7-147		151.7-147		
147-139	147-139			
139-136.8		139-136.8		
136.8-135.9	136.8-135.9			
135.9-120.3		135.9-120.3		
120.3-115.4	120.3-115.4			
115.5-28		115.5-28		
Jiu				
339-302.1	339-302.1	-	-	-
302.1-295.7	-	302.1-295.7	-	-
295.7-295.2	-	-	295.7-295.2	Paroseni intake
295.2-288.6	295.2-288.6	-	-	-
288.6-285	-	288.6-285	-	-
285-257.5	285-257.5	-	-	-
257.5-253	-	-	257.5-253	Valea Sadului – dam under construction
253-231	253-231	-	-	-
231-226.3	-	-	231-226.3	Vadeni and Tg. Jiu
226.3-216.5	-	226.3-216.5	-	-
216.5-209.5	-	-	216.5-209.5	Rovinari (temporary reservoir)
209.5-154	-	209.5-154	0.569	Rovinari reservoir intake
154-146.5	-	-	154-146.5	Turceni
146.5-141.5	-	146.5-141.5	0.250	Turceni reservoir intake
141.5-119.9	141.5-119.9	-	-	-
119.9-98.9	-	119.9-98.9	-	-
98.9-94	-	-	98.9-94	Isalnita
94-0	-	94-0	-	-

Name	**Free flowing section**	**Strongly regulated**	**Impounded river section**	**Name of impoundment**
River section *from rkm - rkm*	***from rkm - rkm***	**Canalized; artificial bank, dike line along main river bed etc.) *from rkm - rkm***	**Length of impoundment *from rkm - rkm***	**e.g. dam for power generation, or reservoir for water supply**
Olt (impounded sections are included in the regulated sections of the Olt river)				
615 - 607	615 - 607			
607 - 605.8			607 - 605.8	Mesteacan
605.8 - 604.7	605.8 - 604.7			
604.7 - 598.7		604.7 - 598.7		
598.7 - 582	598.7 - 582			
582 - 535.9		582 - 535.9		
535.9 - 527	535.9 - 527			
527 - 526			527 - 526	Bixad
526 - 512	526 - 512			
512 - 511		512 - 511		
511 - 505.9	511 - 505.9			
505.9 - 487		505.9 - 487		
487 - 482	487 - 482			
482 - 383.8		482 - 383.8		
383.8 - 366	383.8 - 366			
366 - 364.5		366 - 364.5		
364.5 - 330.5	364.5 - 330.5			
330.5 - 325		330.5 - 325		
325 - 309			325 - 309	Voila
309 - 296			309 - 296	Vistea
296 - 285			296 - 285	Arpasu
285 - 273			285 - 273	Scorei
273 - 258			273 - 258	Avrig
258 - 211	258 - 211			
211 - 202			211 - 202	G.Lotrului
202 - 193			202 - 193	Turnu
193 - 188			193 - 188	Calimanesti
188 - 181			188 - 181	Daesti
181 - 172			181 - 172	Rm.Valcea
172 - 163			172 - 163	Raureni

Name	Free flowing section	Strongly regulated	Impounded river section	Name of impoundment
River section ***from rkm - rkm***	***from rkm - rkm***	**Canalized; artificial bank, dike line along main river bed etc.)** ***from rkm - rkm***	**Length of impoundment** ***from rkm - rkm***	**e.g. dam for power generation, or reservoir for water supply**
163 - 156			163 - 156	Govora
156 - 145			156 - 145	Babeni
145 - 139			145 - 139	Ionesti
139 - 130			139 - 130	Zavideni
130 - 119			130 - 119	Dragasani
119 - 102			119 - 102	Strejesti
102 - 91			102 - 91	Arcesti
91 - 86			91 - 86	Slatina
86- 72			86 - 72	Ipotesti
72 - 60			72 - 60	Draganesti
60 - 46			60 - 46	Frunzaru
46 - 32			46 - 32	Rusanesti
32 - 18			32 - 18	Izbiceni
18 - 0		18 - 0		
Vedea				
227-30	227-30	-	-	-
30-0	-	30-0	-	-
Arges				
317,5-298,8	317,5-298,8	-	-	-
298,8-287,9	-	-	298,8-287,9	Vidraru
287,9-272,3	287,9-272,3	-	-	-
272,3-271,3	-	-	272,3-271,3	Oiesti;
271,3-265,0	–	271,3-265,0	-	-
265,0-264,2	-	-	265,0-264,2	Cerbureni
264,2-258,4	-	264,2-258,4	-	-
258,4-257,9	-	-	258,4-257,9	Curtea de Arges
257,9-255,4	-	257,9-255,4	-	-
255,4-252,2	-	-	255,4-252,2	Zigoneni
252,2-243,2	252,2-243,2	-	-	-
243,2-238,1	-	-	243,2-238,1	Valcele
238,1-233,8	238,1-233,8	–	-	-

Name	Free flowing section	Strongly regulated	Impounded river section	Name of impoundment
River section ***from rkm - rkm***	***from rkm - rkm***	**Canalized; artificial bank, dike line along main river bed etc.)** ***from rkm - rkm***	**Length of impoundment** ***from rkm - rkm***	**e.g. dam for power generation, or reservoir for water supply**
233,8-227,8	-	-	233,8-227,8	Budeasa
227,8-225,5	-	-	227,8-225,5	Bascov
225,5-220,2	225,5-220,2	-	-	-
220,2-217,9	-	-	220,2-217,9	Prundu
217,9-214,2	217,9-214,2	-	-	-
214,2-208,8	-	-	214,2-208,8	Golesti
208,8-172,3	208,8-172,3	-	-	-
172,3-168,6	-	-	172,3-168,6	Zavoiu Orbului
168,6-120,0	168,6-120,0	-	-	-
120,0-116,8	-	-	120,0-116,8	Ogrezeni – under construction
116,8-97,7	116,8-97,7	-	-	-
97,7-85,8	-	-	97,7-85,8	Mihailesti
85,8-0	-	85,8-0	-	-
Ialomita				
417-408	417-408	-	-	
408-405	-	-	408-405	Bolboci
405-376	405-376	-	-	
376-374	-	-	376-374	Pucioasa
374-209	374-209	-	-	
209-198	-	-	209-198	Dridu
198-147	-	198-147	-	
147-77	147-77	-	-	
77-0	-	77-0	-	
Siret				
559-555	559-555	-	-	
555-545		555-553	555-545	Rogojesti - dam for power generation
545-538	545-538	-	-	
538-536	-	538-536	-	
536-510	536-510	-	-	
510-505	-	506-505	510-505	Bucecea reservoir for water supply; dam for power generation

Name	**Free flowing section**	**Strongly regulated**	**Impounded river section**	**Name of impoundment**
River section ***from rkm - rkm***	***from rkm - rkm***	**Canalized; artificial bank, dike line along main river bed etc.)** ***from rkm - rkm***	**Length of impoundment** ***from rkm - rkm***	**e.g. dam for power generation, or reservoir for water supply**
505-400	505-400	-	-	-
400-391	-	400-391	-	Priza Pascani - water supply intake
391-369	391-369		-	
369-349		369-349	-	
349-346	349-346		-	
346-324		346-324	-	
324-322	324-322		-	
322-320		322-320	-	
320-314	320-314		-	
314-311		314-311	-	
311-307	311-307		-	
307-289		307-289	-	
289-218	289-218		-	
218-203	-	218-203	218-212	Galbeni reservoir for water supply; dam for power generation
203-193	-	203-193	211-198	Racaciuni reservoir for water supply; dam for power generation
193-182	-	193-182	-	
182-179	182-179	-	-	
179-161	-	179-161	179-163	Beresti reservoir for water supply; dam for power generation
161-141	161-141	-	-	
141-134	-	141-134	141-134	Calimanesti reservoir for water supply
134-118	134-118	-	-	
118-115	-	118-115	-	
115-106	115-106	-	-	
106-105	-	106-105	-	
105-97	105-97	-	-	
97-0	-	97-0	-	

Name	**Free flowing section**	**Strongly regulated**	**Impounded river section**	**Name of impoundment**
River section ***from rkm - rkm***	***from rkm - rkm***	**Canalized; artificial bank, dike line along main river bed etc.)** ***from rkm - rkm***	**Length of impoundment** ***from rkm - rkm***	**e.g. dam for power generation, or reservoir for water supply**
Moldova				
213-171	213-171	-	-	
171-160	-	171-160	-	
160-116	160-114	-	-	
138-116	-	138-116	-	
116-45	116-45	-	-	
45-38	-	45-38	-	
38-30	38-30	-	-	
30-28	-	30-28	-	
28-16	28-16	-	-	
16-0	-	16-0	-	
Bistrita				
283-230	283-230	-	-	-
230-229		230-229		
229-217	229-217			
217-215		217-215		
215-135	215-135			
135-105	-	-	135-105	Izvorul Muntelui dam for power generation reservoir for water supply;
105-89	105-89	-	-	-
89-86	-	-	89-86	Pingarati dam for power generation
86-82	-	-	86-82	Vaduri dam for power generation
82-79	82-79	-	-	-
79-75		79-75		
75-71	-	-	75-73 73-71	Bitca Doamnei: Dam for power generation; reservoir for water supply
71-69		71-69		
69-40	69-40	-	-	-
40-39		40-39		
39-34	39-34			
34-31	-	34-31	34-31	Racova dam for power generation

Name	Free flowing section	Strongly regulated	Impounded river section	Name of impoundment
River section ***from rkm - rkm***	***from rkm - rkm***	**Canalized; artificial bank, dike line along main river bed etc.)** ***from rkm - rkm***	**Length of impoundment** ***from rkm - rkm***	**e.g. dam for power generation, or reservoir for water supply**
31-25	-	31-25	-	-
25-21	-	-	25-21	Girleni dam for power generation
21-17	-	-	21-17	Lilieci dam for power generation
17-11	17-11	-	-	
11-6	-	-	11-6	Bacau dam for power generation
6-4	-	-	6-4	Redresare UHE Bacau
4-0	-	4-0	-	
Trotus				
162-136	162-136	-	-	
136-134	-	136-134	-	
134-127	134-127	-	-	
127-124	-	127-124	-	
124-122	124-122	-	-	
122-121	-	122-121	-	
121-118	121-118	-		
118-117	-	118-117	-	
117-12	117-12	-	-	
12-3	-	12-3	-	
3-0	3-0	-	-	
Barlad				
207 - 190	207 - 190	-	-	
190 - 183	-	190 - 183	-	
183 - 167	183 - 167	-	-	
167 - 0	-	167 - 0	-	
Buzau				
302-253	302253	-		
253-244	-	-	253-244	Siriu
244191	244-191	-	-	
191-189			191-189	Candesti
189-166	-	189-166	-	
166-123	166-123	-	-	

Name	Free flowing section	Strongly regulated	Impounded river section	Name of impoundment
River section ***from rkm - rkm***	***from rkm - rkm***	**Canalized; artificial bank, dike line along main river bed etc.)** ***from rkm - rkm***	**Length of impoundment** ***from rkm - rkm***	**e.g. dam for power generation, or reservoir for water supply**
123-102	-	123-102	-	
102-87	102-87	-	-	
87-76	-	87-76	-	
76-23	76-23	-	-	
23-0	-	23-0	-	
Prut				
742 - 646	742 - 646	-	-	
646 – 576	-	-	646 - 576	Stanca-Costesti
576 - 497	576 - 497	-	-	
497 - 319	-	497 - 319	-	
319 - 300	319 - 300	-	-	
300 - 296	-	300 - 296	-	
296 - 289	296 - 289	-	-	
289 - 161	-	289 - 161	-	
161 - 146	161 - 146	-	-	
146 - 129	-	146 - 129	-	
129 - 76	129 - 76	-	-	
76 - 0	-	76 - 0		
Jijia (Jijia river is deviated through a 5 km channel to the Prut River)				
275 - 263	275 - 263	-	-	
263 - 259	-	-	263 - 259	Ezer
259 - 110	259 - 110	-	-	
110 - 55	-	110 - 55	-	
55 – *		55 - *		
55 - 0	–55 - 0	-	-	

ANNEX 6 Future Infrastructure Projects affecting Hydromorphological Conditions in the Danube River Basin

The following list of projects is a preliminary list of navigation projects, dams and flood control works, which would add to the hydro-morphological alterations in the Danube River Basin.

This list is not (and is not intended to be) an exhaustive list of planned projects or projects in development but an indicative list giving an information about some of the larger and more important projects or developments, which could affect the hydro-morphological situation along the Danube and its tributaries.

PROJECT NAME / LOCATION	COUNTRY	PROJECT TYPE	PROJECT STATUS	SHORT DESCRIPTION / COMMENTS
Danube – Straubing-Vilshofen	Germany	Navigation - TENs	Plan – Project assessment for regional planning (‘Raumordnungsverfahren’) started in December 2003 and is expected to be finished in 2005.	Part of Corridor VII of the TENs list (Eliminating bottlenecks on the Rhine-Main-Danube-Waterway) of priority projects. The project assessment includes 3 alternative solutions: 1) by fluvial methods only (i.e. groynes, dredging), and 2) by dams/weirs (1 or 3) to improve navigation in the 70 km long stretch of the Danube.
Danube – Vienna-Bratislava	Austria	Navigation – TENs, River-bed-stabilisation and ecological improvement	Plan – Environmental assessment to be prepared.	Part of Corridor VII of the TENs list (Eliminating Bottlenecks on the Rhine-Main-Danube-Waterway) of priority projects. The project involves a variety of infrastructural and ecological measures to improve navigation, the stability of the river bed as well as the ecological conditions along the 50 km stretch of the Danube.
Danube-Odra-Elbe Canal	Czech Republic, Slovakia, Austria, Poland, Germany	Navigation	Preliminary study for urbanistic reserve	Preliminary study on connecting the Danube, Odra and Elbe, supported by the water transport development policy, opposed by the environment policy. It has been discussed for a very long time and is highly controversial. Implementation is not expected in the near future.

PROJECT NAME / LOCATION	COUNTRY	PROJECT TYPE	PROJECT STATUS	SHORT DESCRIPTION / COMMENTS
Port Devinska Nova Ves	Slovakia	Navigation - Port	Baseline study and plan	
Danube – Bratislava / Wolfsthal	Slovakia, Austria	Navigation - Dam	Plan	Supported by the water transport development policy in the Slovak Republic.
Danube - Bratislava	Slovakia	Flood protection	Plan	Flood protection measure
Danube - Gabcikovo/Nagymaros	Slovakia, Hungary	Gabcikova Dam (Slovakia) for power production and navigation	Built – remedial measures needed; ongoing discussion about alternative scheme of operation	Negations are ongoing for the implementation of the decisions of The Hague International Court.
Danube - Palkovicovo - Mohacs	Hungary	Navigation - TENs	Plan	Applied for support for eligible studies on transport, hydraulically and regulatory aspects aiming at the improvement of the navigability of the Danube (eliminating bottlenecks on the Slovak-Hungarian and Hungarian stretches of the Danube).
The New Vásárhelyi Plan/ River Tisza– Hungarian Part	Hungary	Flood protection, regional development	Plan	The proposal comprises a complex programme, which covers the creation of a higher level of flood safety, the improvement of the living standards of rural and urban population in the region, the formulation and introduction of new types of agro-ecological land use in the area of the emergency flood retention reservoirs and the modernisation of the infrastructure in the settlements along the Tisza River.
Sava	Slovenia, Croatia, Bosnia and Herzegovina and Serbia and Montenegro	Navigation	Plan	
Sava	Slovenia, Croatia, Bosnia and Serbia	Navigation	Strategy	Potential location of harbour mentioned in the Spatial Development Strategy of Slovenia, possibly on the border section

PROJECT NAME / LOCATION	COUNTRY	PROJECT TYPE	PROJECT STATUS	SHORT DESCRIPTION / COMMENTS
				of Sava between Slovenia and Croatia.
Blanca Dam	Slovenia	Dam for power production	Project Plan and Environmental Assessment	Preparation of technical documentation in progress for one hydropower plant.
Multipurpose hydrotechnical system/the Drava river	Croatia, Hungary	Power generation, irrigation, flood protection, navigation	Croatian State Physical Planning Programme (1999); design developed	
Multipurpose hydrotechnical system/Mura river	Croatia, Hungary, Slovenia	Power generation, irrigation, flood protection	Croatian State Physical Planning Programme (1999); design developed	
Multipurpose hydrotechnical system/Sava river	Croatia	Power generation, navigation, water supply, irrigation, flood protection	State Physical Planning Programme (1999); design developed	Cooperation with Bosnia i Herzegovina, downstream of the Una River mouth.
Danube-Sava navigable canal	Croatia	Multipurpose hydrotechnical system (navigation, irrigation)	Design developed, initial environmental assessment; state physical planning programme (1999)	
Drina	Serbia and Montenegro	Dams on Drina River	Plan	Several cascade dams on Drina River for hydropower utilization.
Danube between Bulgaria and Romania	Bulgaria, Romania	Navigation - TENs	Plan	Negotiations foreseen between the Romanian and Bulgarian Environment and Transport Authorities in order to mitigate the adverse impact on the water status.
Danube Port of Moldova	Moldova	Navigation	Plan – partially begun	
Ukrainian Danube Delta Canal	Ukraine	Navigation	Under construction	

ANNEX 7 Alert thresholds for water pollution incidents in the framework of the international Danube Accident Emergency Warning System

The following tables provide guideline for the determination of alert thresholds levels for the Principal International Alert Centres (PIAC) and warning messages. If the values in the tables are exceeded in the case of an accidental release of some substances into surface waters a warning message has to be launched by relevant PIAC according to AEWS International Operation Manual.

Substance classifications		**Thresholds for warning message**	
		flow rates below 1000 m^3/s	**flow rates above 1000 m^3/s**
Water Risk Class	**R - phrases**	**Substance amount (kg) or (l)**	**Substance amount (kg) or (l)**
"0"	- 22	≥ 100 000	≥ 1 000 000
1	- 25, 52/53, 52 or 53	≥ 10 000	≥ 100 000
2	- 50, 51/53, 28 or 45 - (52/53, 52 or 53) **and** (22 or 25)	≥ 1 000	≥ 10 000
3	- 50/53 - (50, 51/53, 52/53, 52 or 53) **and** (45 or 28) - 45 **and** 28	≥ 100	≥ 1 000
Water Risk Index (WRI)		**≥ 2**	**≥ 3**

The substances most frequently released by accidents in the Danube catchment area are heterogeneous groups of substances and mixtures and dominating substances are the oil compounds. The alert thresholds for the substance mixture can be characterized by classifying the corresponding indicator substance.

For non-specified oils, quench water suspended ash and slurry the following alert thresholds are applied:

Released substance mixture	**Thresholds for warning message**	
	flow rates below 1000 m^3/s	**flow rates above 1000 m^3/s**
	Substance mixture amount (kg) or (l)	**Substance mixture amount (kg) or (l)**
Oils (non-specified)	≥ 1 000	≥ 10 000
Quench water (fire extinguishing water)	≥ 10 000	≥ 100 000
Slurry and Sewage (animal)	≥ 10 000	≥ 100 000
Suspended ash	≥ 100.000	≥ 1.000.000

ANNEX 8 List of determinands and water quality classifications used in TNMN

Determinand	**Unit**	**Class**				
		I	**II - TV**	**III**	**IV**	**V**
		Class limit values				
Oxygen/Nutrient regime						
Dissolved oxygen *	$mg.l^{-1}$	7	6	5	4	< 4
BOD_5	$mg.l^{-1}$	3	5	10	25	> 25
COD_{Mn}	$mg.l^{-1}$	5	10	20	50	> 50
COD_{Cr}	$mg.l^{-1}$	10	25	50	125	> 125
pH	-		> 6.5* and < 8.5			
Ammonium-N	$mg.l^{-1}$	0.2	0.3	0.6	1.5	> 1.5
Nitrite-N	$mg.l^{-1}$	0.01	0.06	0.12	0.3	> 0.3
Nitrate-N	$mg.l^{-1}$	1	3	6	15	> 15
Total-N	$mg.l^{-1}$	1.5	4	8	20	> 20
Ortho-phosphate-P	$mg.l^{-1}$	0.05	0.1	0.2	0.5	> 0.5
Total-P	$mg.l^{-1}$	0.1	0.2	0.4	1	> 1
Chlorophyll-a	$\mu g.l^{-1}$	25	50	100	250	> 250
Metals (dissolved) **						
Zinc	$\mu g.l^{-1}$	-	5	-	-	-
Copper	$\mu g.l^{-1}$	-	2	-	-	-
Chromium (Cr-III+VI)	$\mu g.l^{-1}$	-	2	-	-	-
Lead	$\mu g.l^{-1}$	-	1	-	-	-
Cadmium	$\mu g.l^{-1}$	-	0.1	-	-	-
Mercury	$\mu g.l^{-1}$	-	0.1	-	-	-
Nickel	$\mu g.l^{-1}$	-	1	-	-	-
Arsenic	$\mu g.l^{-1}$	-	1	-	-	-
Metals (total)						
Zinc	$\mu g.l^{-1}$	bg	100	200	500	> 500
Copper	$\mu g.l^{-1}$	bg	20	40	100	> 100
Chromium (Cr-III+VI)	$\mu g.l^{-1}$	bg	50	100	250	> 250
Lead	$\mu g.l^{-1}$	bg	5	10	25	> 25
Cadmium	$\mu g.l^{-1}$	bg	1	2	5	> 5
Mercury	$\mu g.l^{-1}$	bg	0.1	0.2	0.5	> 0.5
Nickel	$\mu g.l^{-1}$	bg	50	100	250	> 250
Arsenic	$\mu g.l^{-1}$	bg	5	10	25	> 25
Toxic substances						
AOX	$\mu g.l^{-1}$	10	50	100	250	> 250
Lindane	$\mu g.l^{-1}$	0.05	0.1	0.2	0.5	> 0.5
p,p´-DDT	$\mu g.l^{-1}$	0.001	0.01	0.02	0.05	> 0.05
Atrazine	$\mu g.l^{-1}$	0.02	0.1	0.2	0.5	> 0.5
Trichloromethane	$\mu g.l^{-1}$	0.02	0.6	1.2	1.8	> 1.8
Tetrachloromethane	$\mu g.l^{-1}$	0.02	1	2	5	> 5
Trichloroethene	$\mu g.l^{-1}$	0.02	1	2	5	> 5
Tetrachloroethene	$\mu g.l^{-1}$	0.02	1	2	5	> 5
Biology						
Saprobic Index - macrozoobenthos	-	≤ 1.8	1.81 – 2.3	2.31 – 2.7	2.71 – 3.2	> 3.2

* values concern 10-percentile value
** for dissolved metals only guideline values are indicated

bg background values
TV target value

ANNEX 9 Interim scheme for water and sediment quality classification for TNMN purposes*

Interim scheme for water and sediment quality classification for TNMN purposes *

Determinands in water (90-Percentiles)

		reference	**TV**	**1- 2x TV**	**2- 5x TV**	**> 5x TV**
		CLASS				
class limit values	unit	**I**	**II**	**III**	**IV**	**V**
oxygen/nutrient regime						
temperature	C					
dissolved oxygen **	mg/l	7	6	5	4	<4
BOD5	mg/l	3	5	10	25	>25
COD-Mn	mg/l	5	10	20	50	>50
COD-Cr	mg/l	10	25	50	125	>125
TOC		-	-	-	-	-
pH (acid.)	-		>6.5			
pH (alkal.)	-		and <8.5			
ammonium-N	mg/l	0.2	0.3	0.6	1.5	>1,5
nitrite-N	mg/l	0.01	0.06	0.12	0.3	>0,3
nitrate-N	mg/l	1	3	6	15	>15
total-N	mg/l	1.5	4	8	20	>20
organic-N	mg/l					
ortho-P	mg/l	0.05	0.1	0.2	0.5	>0,5
total-P	mg/l	0.1	0.2	0.4	1	>1
chlorophyll -a	ug/l	25	50	100	250	>250
ions						
calcium (Ca)	mg/l	-	-	-	-	
sulphate (SO4)	mg/l	-	-	-	-	
magnesium (Mg)	mg/l	-	-	-	-	-
potassium (K)	mg/l	-	-	-	-	-
sodium (Na)	mg/l	-	-	-	-	-
manganese (Mn)	mg/l	-	-	-	-	-
iron (Fe)	mg/l	-	-	-	-	-
chloride (Cl)	mg/l	-	-	-	-	-
metals (dissolved) * **						
Zinc (Zn)	ug/l	-	5	-	-	-
Copper (Cu)	ug/l	-	2	-	-	-
Chromium /Cr-III+VI)	ug/l	-	2	-	-	-
Lead (Pb)	ug/l	-	1	-	-	-
Cadmiun (Cd)	ug/l	-	0.1	-	-	-
Mercury (Hg)	ug/l	-	0.1	-	-	-
Nickel (Ni)	ug/l	-	1	-	-	-
Arsenic (As)	ug/l	-	1	-	-	-
Aluminium (Al)	ug/l	-	-	-	-	-

Interim scheme for water and sediment quality classification for TNMN purposes *

metals (total)						
Zinc (Zn)	ug/l	bg	100	200	500	> 500
Copper (Cu)	ug/l	bg	20	40	100	> 100
Chromium (Cr-III+VI)	ug/l	bg	50	100	250	> 250
Lead (Pb)	ug/l	bg	5	10	25	> 25
Cadmium (Cd)	ug/l	bg	1	2	5	> 5
Mercury (Hg)	ug/l	bg	0.1	0.2	0.5	> 0,5
Nickel (Ni)	ug/l	bg	50	100	250	> 250
Arsenic (As)	ug/l	bg	5	10	25	> 25
Aluminium (Al)	ug/l					
toxic substances						
phenol index						
Anionic active surfactants						
AOX	ug/l	10	50	100	250	>250
Petroleum hydrocarbons		-	-	-	-	-
PAH (sum of 6)		-	-	-	-	-
PCB (sum of 7)		-	-	-	-	-
lindane/c-HCH	ug/l	0.05	0.1	0.2	0.5	> 0.5
pp'-DDT	ug/l	0.001	0.01	0.02	0.05	> 0.05
atrazine	ug/l	0.02	0.1	0.2	0.5	> 0.5
trichloromethane	ug/l	0.02	0.6	1.2	1.8	>1.8
tetrachloromethane	ug/l	0.02	1	2	5	> 5
trichloroethane	ug/l	0.02	1	2	5	> 5
tetrachloroethane	ug/l	0.02	1	2	5	> 5
biology						
aprobic index MZB		≤1,8	1,81 - 2,3	2,31 - 2,7	2,71 - 3,2	>3,2
microbiology						
total coliformes	/100 ml	-	-	-	-	-
faecal coliforms	/100 ml	-	-	-	-	-

* - This classification system was elaborated for the general presentation of the situation in the Danube river basin (assessment of TNMN stations) and not to be a tool for implementation of national water policy
** - values concern 10-percentile value
*** - for dissolved metals only guideline values are indicated
bg - background values
TV - target value

The following colours express **water quality classes**:

blue colour	**class I**
green colour	**class II**
yellow colour	**class III**
orange colour	**class IV**
red colour	**class V**

ANNEX 10 List of TNMN Monitoring Sites located on the Danube River and its tributaries

Country Code	River	Town/Location	Distance (km)	River km	DEFF Code	Location in	Section
D01	Danube	Neu-Ulm	2581	2581	L2140	L	UPPER
D03	/ Inn	Kirchdorf	195	/ 2225	L2150	M	
D04	/ Inn / Salzach	Laufen	47	-	L2160	M	
D02	Danube	Jochenstein	2204	2204	L2130	M	
A01	Danube	Jochenstein	2204	2204	L2220	M	
A02	Danube	Abwinden-Asten	2120	2120	L2200	R	
A03	Danube	Wien-Nussdorf	1935	1935	L2180	R	
CZ01	/ Morava	Lanzhot	79	/ 1880	L2100	R	
CZ02	/ Morava / Dyje	Breclav	17	-	L2120	R	
A04	Danube	Wolfsthal	1874	1874	L2170	R	
SK01	Danube	Bratislava	1869	1869	L1840	M	MIDDLE
SK02	Danube	Medvedov/Medve	1806	1806	L1860	M	
H01	Danube	Medve/Medvedov	1806	1806	L1470	M	
SK03	Danube	Komarno/Komarom	1768	1768	L1870	M	
H02	Danube	Komarom/Komarno	1768	1768	L1475	M	
SK04	/ Vah	Komarno	1	/ 1766	L1960	M	
H03	Danube	Szob	1708	1708	L1490	LMR	
H04	Danube	Dunafoldvar	1560	1560	L1520	LMR	
H06	/ Sio	Szekszard - Palank	13	/ 1497	L1604	M	
H05	Danube	Hercegszanto	1435	1435	L1540	LMR	
HR01	Danube	Batina	1429	1429	L1315	M	
SL01	/ Drava	Ormoz	300	-	L1390	L	
HR03	/ Drava	Varazdin	288	-	L1290	M	
HR04	/ Drava	Botovo	227	-	L1240	M	
HR05	/ Drava	D. Miholjac	78	/ 1379	L1250	R	
H07	/ Drava	Dravaszabolcs	78	/ 1379	L1610	M	
HR02	Danube	Borovo	1337	1337	L1320	R	
H08	/ Tisza	Tiszasziget	163	/ 1215	L1700	LMR	
H09	/ Tisza/ Sajo	Sajopuspoki	124	-	L1770	M	
SL02	/ Sava	Jesenice	729	-	L1330	R	
HR06	/ Sava	Jesenice	729	-	L1220	R	
HR07	/ Sava	Us. Una Jasenovac	525	-	L1150	L	
HR08	/ Sava	Ds. Zupanja	254	/ 1170	L1060	M	

Country Code	River	Town/Location	Distance (km)	River km	DEFF Code	Location in	Section
RO01	Danube	Bazias	1071	1071	L0020	LMR	LOWER
RO02	Danube	Pristol/Novo Selo	834	834	L0090	LMR	
BG01	Danube	Novo Selo/Pristol	834	834	L0730	LMR	
BG02	Danube	Us. Iskar - Bajkal	641	641	L0780	M	
BG06	/ Iskar	Orechovitza	28	637	L0930	M	
BG03	Danube	Ds. Svishtov	554	554	L0810	MR	
BG07	/ Jantra	Karantzi	12	537	L0990	M	
BG04	Danube	Us. Russe	503	503	L0820	MR	
BG08	/ Russenski Lom	Basarbovo	13	498	L1010	M	
RO03	Danube	Us. Arges	432	432	L0240	LMR	
RO04	Danube	Chiciu/Silistra	375	375	L0280	LMR	
RO09	/ Arges	Conf. Danube	0	/ 432	L0250	M	
BG05		Silistra/Chiciu		375	L0850	LMR	
RO10	/ Siret	Conf. Danube -	0	/ 154	L0380	M	
MD01	/ Prut	Lipcani	658	-	L02230	L	
MD02	/ Prut	Leuseni	292	-	L02250	M	
MD03	/ Prut	Conf. Danube -	0	/ 135	L02270	M	
RO11	/ Prut	Conf. Danube -	0	/ 135	L0420	M	
RO05	Danube	Reni-Chilia/KiliaArm	132	132	L0430	LMR	
UA01	Danube	Reni-Kilia Arm/Chilia	132	132	L0630	M	
RO06	Danube	Vilkov-Chilia	18	18	L0450	LMR	
UA02	Danube	Vilkov-Kilia	18	18	L0690	M	
RO07	Danube	Sulina – Sulina Arm	0	0	L0480	LMR	
RO08	Danube	Sf. Gheorghe – Sf.	0	0	L0490	LMR	

- River: The water course where the sampling site is located
- Distance: The distance (km) from the mouth of the considered river
- River km (rkm): The Danube River km (from confluence with the Black Sea) where the sampling site is located
- / Tributary
- Us. – Upstream of
- Ds. – Downstream of
- Conf.: Confluence tributary / main river
- Location in profile:
    - L – left bank of the river
    - M – middle of the river
    - R – right bank of the river
- Section:
    - Upper Danube
    - Middle Danube
    - Lower Danube

ANNEX 11 Important Heavily Modified Surface Waters (Provisional Identification)

Table 1 List of heavily modified water sections meeting basin-wide harmonised criteria on the Danube River

	Code of stretch or water body	Country	Name of stretch or water body	Length (km)	Main uses				Significant physical alterations			Reasons for risk to reach GES (expert judgement)				
					Hydropower	Navigation	Flood protection	Urbanisation	Dams/weirs	Channelisation/ straightening	Bank reinforcement/ fixation	Not passable obstacles (weirs/dams)	Change of water category	Impoundment with significant flow reduction	Disruption of lateral connectivity	Others
1.	DE1_438971_514553	DE	Donau_DE1_437941_514553	76.6	x	x	x		x					x		
2.	DE1_370651_423305	DE	Donau_DE1_370651_423305	52.7	x	x	x		x					x		
3.	DE1_312047_341487	DE	Donau_DE1_312047_341487	29.4	x	x	x		x					x		
4.	DE1_255218_312047	DE	Donau_DE1_255218_312047	56.8	x	x	x		x					x		
5.	DE1_157710_183099	DE	Donau_DE1_157710_183099	25.4	x	x	x		x					x		
6.	DE1_183099_255218	DE	Donau_DE1_183099_255218	72.1		x	x	x	x	(x)	x					
7.	DE1_134693_157710	DE	Donau_DE1_134693_157710	23.0	x	x	x		x					x		
8.	ATD1	AT	AT_4103600 (Jochenstein to beginning of Wachau)	165	x	x	x	x	x	x	x	x		x	x	
9.	ATD2	AT	AT_4090300 (Headrace HPS Altenwörth to Freudenau)	81	x	x	x	x	x	x	x	x		x	x	
10.	SK01	SK	Dunaj	28.2	x	x	X	x	x	x	x	x	x	x	x	
11.	SK02/HU01	SK/HU	Dunaj	62.3		x	x		x	x	x			x	x	
12.	SK03/HU02	SK/HU	Dunaj	81.3		x	x	x		x	x				x	
13.	HR D1/CS_D9[1]	HR/CS	-	51/51		X/x	X/x			X/-	X/x				X/x	D/-
14.	HR D2/CS_D8[2]	HR/CS	-	87/127		X/x	X/x			X/-	X/x				X/x	D/-

[1] HR D1 and CS_D9 are on the border of Croatia and Serbia-Montenegro. The two sections coincide. The right side of the slash refers to the Serbian and the left side of the slash to the Croatian section. Information needs to be updated after the harmonisation of data.

Code of stretch or water body		Country	Name of stretch or water body	Length (km)	Main uses				Significant physical alterations			Reasons for risk to reach GES (expert judgement)				
					Hydropower	Navigation	Flood protection	Urbanisation	Dams/weirs	Channelisation/ straightening	Bank reinforcement/ fixation	Not passable obstacles (weirs/dams)	Change of water category	Impoundment with significant flow reduction	Disruption of lateral connectivity	Others
15.	CS_D4	CS	Iron Gate I	30	X	X	X		X		X	X		X	X	L, D
16.	CS_D5	CS	Iron Gate I	65	X	X	X		X		X	X			X	D
17.	CS_D6	CS	Iron Gate I	45	X	X	X		X		X	X			X	D
18.	CS_D7	CS	Iron Gate I	40	X	X	X		X		X	X	X		X	D
19.	ROD1/CS-D3[3]	RO/CS	Iron Gate I	132/132	X/x	X/x		X/-	X/x		-/x	X/x	X/x	X/-		-/S
20.	ROD2/CS_D2[4]	RO/CS	Iron Gate II	80/80.2	X/x	X/x	X/-	X/-	X/x		-/x	X/x	X/-	X/-		-/H
21.	ROD3a/CS_D1[5]	RO/ CS	Downstr. Iron Gate II	17.5/17.3	-/x	X/x	X/-	X/x	X/x		X/x	-/x	-/x		X/-	D/H
22.	ROD3b/BGD1[6]	RO/BG	Downstr. Iron Gate II / Novo Selo-Chiciu/Silistra	470/470		x	x	x	x		x				x	D
23.	ROD4	RO	Chiciu/Silistra - Isaccea	278		x	x	x		x					x	

D = Dredging, H = Changed discharge (effects caused by hydropeaking), L = Levees, S = Sediment

[2] The Serbian section CS_D8 is on the border of Serbia-Montenegro and Croatia and it includes the Croatian section HR D2. The right side of the slash refers to the Serbian and the left side of the slash to the Croatian section. Information needs to be updated after the harmonisation of data.

[3] ROD1 and CS_D3 are on the border of Romania and Serbia-Montenegro. The two sections coincide. The right side of the slash refers to the Serbian and the left side of the slash to the Romanian section. Information needs to be updated after the harmonisation of data.

[4] ROD2 and CS_D2 are on the border of Romania and Serbia-Montenegro. The two sections coincide. The right side of the slash refers to the Serbian and the left side of the slash to the Romanian section. Information needs to be updated after the harmonisation of data.

[5] ROD3a and CS_D1 are on the border of Romania and Serbia-Montenegro. The two sections coincide. The right side of the slash refers to the Serbian and the left side of the slash to the Romanian section. Information needs to be updated after the harmonisation of data. (The Romanian section ROD3 has been separated into ROD3a and ROD3b only for the purposes of the Roof Report in order to reflect its transboundary character with Serbia-Montenegro and Bulgaria).

[6] ROD3b and BGD1 are on the border of Romania and Bulgaria. The two sections coincide. The right side of the slash refers to the Bulgarian and the left side of the slash to the Romanian section.

Table 2 List of heavily modified water sections meeting basin-wide harmonised criteria on the tributaries of the DRBD

	Code of stretch or water body	Country	River name	Name of water body or stretch	Length (km)	Main uses				Significant physical alterations			Reasons for risk to reach GES (expert judgement)				
						Hydropower	Navigation	Flood protection	Urbanisation	Dams/weirs	Channelisation/ straightening	Bank reinforcement/ fixation	Not passable obstacles (weirs/dams)	Change of water category	Impoundment with significant flow reduction	Disruption of lateral connectivity	Others
1.	DE12_0_19594	DE	Lech	Lech_DE12_0_19594	19.6	x		x		x		x			x	x	
2.	DE12_123906_130257	DE	Lech	Lech_DE12_123906_130257	6.4	x		x		x		x			x	x	
3.	DE12_130257_136620	DE	Lech	Lech_DE12_130257_136620	6.4	x		x		x		x			x	x	
4.	DE12_136620_150940	DE	Lech	Lech_DE12_136620_150940	14.3	x		x		x		x			x	x	
5.	DE12_150940_160199	DE	Lech	Lech_DE12_150940_160199	9.3	x		x		x		x			x	x	
6.	DE12_160199_162022	DE	Lech	Lech_DE12_160199_162022	1.8	x		x		x		x			x	x	
7.	DE12_162022_164994	DE	Lech	Lech_DE12_162022_164994	3.0	x		x		x		x			x	x	
8.	DE12_19594_39107	DE	Lech	Lech_DE12_19594_39107	19.5	x		x		x		x			x	x	
9.	DE12_39107_46896	DE	Lech	Lech_DE12_39107_46896	7.8	x		x	x	x		x			x	x	
10.	DE12_46896_56762	DE	Lech	Lech_DE12_46896_56762	9.9	x		x		x		x			x	x	
11.	DE12_56762_123906	DE	Lech	Lech_DE12_56762_123906	67.1	x		x		x		x			x	x	
12.	DE16_3962_77991	DE	Isar	Isar_DE16_3962_77991	74.0	x		x		x			x				
13.	DE18_127888_183539	DE	Inn	Inn_DE18_127888_183539	55.7	x		x		x							
14.	DE18_183539_216152	DE	Inn	Inn_DE18_183539_216152	32.6	x		x		x							
15.	DE18_4560_67807	DE	Inn	Inn_DE18_4560_67807	63.2	x		x		x							
16.	DE18_67807_100691	DE	Inn	Inn_DE18_67807_100691	32.9	x		x		x							
17.	ATT1	AT	Inn	HMWB Water Stretch				x	(x)		x	x					H
18.	ATT2	AT	Traun	HMWB Water Stretch				x	x		x	x					H
19.	ATT3	AT	Enns	HMWB Water Stretch		x		x	x	x	x	x	x		x		R
20.	ATT4	AT	Morava	AT_5000200	69.1	x		x	(x)	x	x	x	x		x		R

Code of stretch or water body	Country	River name	Name of water body or stretch	Length (km)	Main uses				Significant physical alterations			Reasons for risk to reach GES (expert judgement)				
					Hydropower	Navigation	Flood protection	Urbanisation	Dams/weirs	Channelisation/ straightening	Bank reinforcement/ fixation	Not passable obstacles (weirs/dams)	Change of water category	Impoundment with significant flow reduction	Disruption of lateral connectivity	Others
21. ATT5	AT	Thaya	AT_5000101	101.2	x		x	(x)	x	x	x	x		x		H,R
22. ATT6	AT	Raab	AT_7002101	63.0		(x)	x	(x)		x	x					
23. ATT7	AT	Drau	HMWB Water Stretch		x		x	(x)	x		x	x		x		
24. ATT8	AT	Drau	HMWB Water Stretch		x		x	(x)	x	x	x	x		x		R
25. ATT9	AT	Mur	AT_8011801	49.0	x		x	x	x	x	x	x		x		R,H
26. ATT10	AT	Mur	AT_8027102	72.0	x		x	(x)	x	x	x	x		x		R,H
27. ATT11	AT	Salzach	HMWB Water Stretch		x		x	x	x	x	x	x		x		R
28. ATT12	AT	Salzach	HMWB Water Stretch				x	x		x	x					
29. CZ_M9	CZ	Morava	Morava confluence with Dyje	85.6			x	x	x	x	x	x			x	
30. SKT1	SK	Vah	-	88.3	x		x	x	x	x	x	x	x	x	x	
31. SKT2	SK	Vah	-	154.9	x		x	x	x	x	x	x	x	x	x	
32. SKT3	SK	Vah	-	76	x	x	x	x	x	x	x	x	x	x	x	
33. SKT4	SK	Hornad	-	68.6	x		x	x	x			x	x	x		
34. SKT5	SK	Hornad	-	66.3			x	x	x	x	x	x			x	
35. HU_RW_AAA580_0000-0057_S	HU	Soroksári-(Ráckevei) Duna	Soroksári-Duna, teljes szakasz	57	X			X	X					X		
36. HU_RW_AAB622_0087-0119_S	HU	Mosoni-Duna	országhatár - Lajta torkolat	32					X	X		X		X	X	
37. HU_RW_AAB622_0015-0087_M	HU	Mosoni-Duna	Lajta torkolat - Rába torkolat	72			X			X					X	
38. HU_RW_AAB622_0000-	HU	Mosoni-	Rába torkolat - Duna	15			X	X		X	X				X	

Code of stretch or water body	Country	River name	Name of water body or stretch	Length (km)	Main uses				Significant physical alterations			Reasons for risk to reach GES (expert judgement)				
					Hydropower	Navigation	Flood protection	Urbanisation	Dams/weirs	Channelisation/ straightening	Bank reinforcement/ fixation	Not passable obstacles (weirs/dams)	Change of water category	Impoundment with significant flow reduction	Disruption of lateral connectivity	Others
0015_S		Duna														
39. HU_RW_AAA921_0048-0086_S	HU	Répce	árapasztó - Kis Rába torkolat	38			X		X	X		X		X	X	
40. HU_RW_AAB683_0000-0048_S	HU	Rábca	Kis-Rába torkolat - Mosoni Duna	48			X		X	X		X		X	X	
41. HU_RW_AAA248_0000-0133_S	HU	Ipoly	országhatár - Duna	133			X		X	X	X	X			X	
42. HU_RW_AAB026_0079-0121_S	HU	Sió	Balaton - Kapos torkolatig	42		X	X		X	X	X	X			X	X[1]
43. HU_RW_AAB026_0000-0079_S	HU	Sió	Kapos torkolattól - Duna	79		X	X			X	X	X			X	X[2]
44. HU_RW_AAA506_0521-0569_S	HU	Tisza	Belfő-csatorna - Tiszalök	48	X	X	X		X	X	X	X		X	X	
45. HU_RW_AAA506_0402-0521_S	HU	Tisza	Tiszalök - Kisköre	119	X	X	X		X	X	X	X		X	X	
46. HU_RW_AAA506_0160-0243_S	HU	Tisza	Csongrád - országhatár	83	X	X	X	X	X	X	X	X		X	X	
47. HU_RW_AAA614_0000-0051_S	HU	Bodrog	országhatár - Tisza	51			X			X		X		X	X	
48. HU_RW_AAA532_0000-0094_S	HU	Hernád	Szartos-patak -Sajó	94	X		X		X	X	X	X		X	X	
49. HU_RW_AAB074_0063-0127_S	HU	Zagyva	Jobbágyi - Tarna torkolat	64			X		X	X	X	X		X	X	
50. HU_RW_AAA250_0000-0020_S	HU	Fekete-Körös	országhatár - Kettős-Körös	20			X			X	X	X		X	X	
51. HU_RW_AAA510_0000-0010_S	HU	Fehér-Körös	országhatár - Kettős-Körös	10	X		X		X	X	X	X		X	X	
52. HU_RW_AAA198_0000-0037_S	HU	Kettős-Körös	kezdet - Hármas-Körös	37			X		X	X	X	X		X	X	

Code of stretch or water body	Country	River name	Name of water body or stretch	Length (km)	Main uses				Significant physical alterations			Reasons for risk to reach GES (expert judgement)				
					Hydropower	Navigation	Flood protection	Urbanisation	Dams/weirs	Channelisation/ straightening	Bank reinforcement/ fixation	Not passable obstacles (weirs/dams)	Change of water category	Impoundment with significant flow reduction	Disruption of lateral connectivity	Others
53. HU_RW_AAB680_0015-0058_S	HU	Sebes-Körös	országhatár - Berettyó torkolat	43			X		X	X	X	X		X	X	
54. HU_RW_AAB680_0000-0015_S	HU	Sebes-Körös	Berettyó torkolat - Hármas Körös	15			X			X	X	X		X	X	
55. HU_RW_AAA582_0000-0091_S	HU	Hármas-Körös	kezdet - Tisza	91	X		X		X	X	X	X		X	X	
56. HU_RW_AAB724_0065-0093_S	HU	Hortobágy-főcsatorna	Keleti-főcsatorna - Hortobágy-Kadarcs	28						X		X			X	F
57. HU_RW_AAB724_0000-0065_S	HU	Hortobágy-főcsatorna	Hortobágy-Kadarcs. - Hortobágy-Berettyó	65					X	X		X			X	F
58. HU_RW_AAA160_0000-0079_S	HU	Hortobágy-Berettyó	Hortobágy főcs. torkolat - Hármas-Körös	79			X		X	X		X			X	F
59. HR T1	HR	Drava	-	86.3	x		x	x	x	x	x		x	x		
60. SIT1[7]	SI	Drava	Drava SI-AT border - Maribor	67	x				x		x					
61. CS_T1	CS	Sava	CS_SA_1	102		X	X	X			X		X		X	D
62. CS_T2	CS	Sava	CS_SA_2	75		X	X				X				X	D
63. CS_T3	CS	Sava	CS_SA_3	32		X	X				X				X	D
64. CS_T4	CS	Drina	CS_DR_1	91			X				X		X			H
65. CS_T5	CS	Drina	CS_DR_2	29	X				X	X		X				
66. CS_T6	CS	Drina	CS_DR_3	79.5	P				P			P	P			H

[7] No information available yet on ‘reasons for risk to reach GES’

Code of stretch or water body	Country	River name	Name of water body or stretch	Length (km)	Main uses				Significant physical alterations			Reasons for risk to reach GES (expert judgement)				
					Hydropower	Navigation	Flood protection	Urbanisation	Dams/weirs	Channelisation/ straightening	Bank reinforcement/ fixation	Not passable obstacles (weirs/dams)	Change of water category	Impoundment with significant flow reduction	Disruption of lateral connectivity	Others
67. CS_T7	CS	Drina	CS_DR_4	56.8	X				X			X	X			
68. CS_T8	CS	Velika Morava	CS_VMOR_1	21.7		X	X			X	X		X		X	D
69. CS_T9	CS	Velika Morava	CS_VMOR_2	76.3			X			X	X				X	
70. CS_T10	CS	Velika Morava	CS_VMOR_3	76			X			X	X				X	
71. CS_T11	CS	Zapadna Morava	CS_ZMOR_3	39	X		X	X	X		X	X	X			
72. CS_T12	CS	Juzna Morava	CS_JMOR_2	63			X			X	X				X	D
73. CS_T13	CS	Juzna Morava	CS_JMOR_3	20			X			X	X				X	D
74. CS_T14	CS	Juzna Morava	CS_JMOR_4	49			X			X	X				X	D
75. CS_T15	CS	Juzna Morava	CS_JMOR_6	47			X								X	
76. CS_T16	CS	Nisava	CS_NIS_1	29			X	X		X	X				X	
77. CS_T19	CS	Timok	CS_TIM_1	10				X			X					S
78. CS_T20	CS	Timok	CS_TIM_2	30												S
79. CS_T21	CS	Timok	CS_TIM_3	19												S
80. CS_T22	CS	Timok	CS_TIM_4	19	X				X							S
81. CS_T23	CS	Timok	CS_TIM_5	12			P			P	P					
82. CS_T24	CS	Tamis	CS_TAM_1	80.9		X	X	X	X	X		X	X	X	X	
83. CS_T25	CS	Tamis	CS_TAM_2	36.4			X		X			X	X		X	
84. CS_T26	CS	Tisza	CS_TIS_1	63		X	X				X				X	D

	Code of stretch or water body	Country	River name	Name of water body or stretch	Length (km)	Main uses				Significant physical alterations			Reasons for risk to reach GES (expert judgement)				
						Hydropower	Navigation	Flood protection	Urbanisation	Dams/weirs	Channelisation/ straightening	Bank reinforcement/ fixation	Not passable obstacles (weirs/dams)	Change of water category	Impoundment with significant flow reduction	Disruption of lateral connectivity	Others
85.	CS_T27	CS	Tisza	CS_TIS_2	98		X	X		X		X	X	X	X	X	
86.	ROT1	RO	Crisul Alb/ Feher Koros	confluence Sebis- RO-HU border	91			x			x	x				x	
87.	ROT2	RO	Crisul Negru/ Fekete Koros	confluence Poclusa-RO-HU border	91			x				x				x	
88.	ROT3	RO	Barcau/ Berettyo	confluence Camar- RO-HU border	68			x				x				x	
89.	ROT4	RO	Mures/ Maros	Arad - RO-HU border	65			x	x							x	
90.	ROT5	RO	Timis/ Tamis	Timisana confluence-RO-SMR border	87			x			x				x	x	
91.	ROT6	RO	Olt	upstream Voila - downstream Avrig Reservoirs	67	x		x		x		x		x			
92.	ROT7	RO	Olt	upstream Cornetu - downstream Babeni Reservoir	73	x		x	x	x		x		x			
93.	ROT8	RO	Olt	upstream Ionesti - downstream Frunzaru Reservoirs	87	x		x		x		x		x		x	
94.	ROT9	RO	Arges	downstream Mihailesti Reservoir - confl. Dambovita	55.8			x			x	x			x	x	
95.	ROT10	RO	Ialomita	Slobozia-confl. with Danube	77			x			x					x	
96.	ROT11	RO	Buzau	downstream confluence with Costei-confluence with Siret	131			x			x					x	

Code of stretch or water body	Country	River name	Name of water body or stretch	Length (km)	Main uses				Significant physical alterations			Reasons for risk to reach GES (expert judgement)				
					Hydropower	Navigation	Flood protection	Urbanisation	Dams/weirs	Channelisation/ straightening	Bank reinforcement/ fixation	Not passable obstacles (weirs/dams)	Change of water category	Impoundment with significant flow reduction	Disruption of lateral connectivity	Others
97. ROT12	RO	Barlad	confl. Garboveta - confl. Crasna	72			x	x		x	x				x	
98. ROT13	RO	Barlad	confl. Crasna - confl. Siret	116			x	x		x	x				x	
99. ROT14	RO	Prut	downstream Stanca Reservoir- confl Solonet/Pruteni	78			x		x		x			x		
100. ROT15	RO	Prut	downstream confl Solonet/Pruteni - confl Jijia/Nemteni	180			x	x			x			x	x	
101. ROT16	RO	Jijia	Chiperesti - former confluence Prut	55			x			x		x		x	x	

P = Planned, D = Dredging, H = Changed discharge (effects caused by hydropeaking), R = Changed discharge (effects caused by residual water discharge), S = Sediment, F= Flow regime is a function of the water regime of neighbouring water bodies

ANNEX 12 List of nominated transboundary groundwater bodies and groups of groundwater bodies

NAME	MS_CD	Size	Natio-nal size	Aquifer characteri-sation		Main use	Overlying strata	Criteria for importance	Risk		bilaterally agreed with
				Aquifer Type	Confined				Quality	Quantity	
1: Deep Groundwater Body – Thermal Water	DEGK1110	5,900	4,250	K	Yes	SPA, CAL	100-1000	Intensive use	No	No	AT, DE
	ATGK100158		1,650								
2: Upper Jurassic – Lower Cretaceous GWB	BG_DGW02	26,903	15,476	F, K	Yes	DRW, AGR, IND	0-600	> 4,000 km²	No	No	RO, BG
	RO_DL06		11,427								
3: Middle Sarmatian - Pontian GWB	ROPR05	21,626	11,964	P	Yes	DRW, AGR/DRW, AGR, IND	0-150	> 4,000 km²	No/ Yes	No	MD, RO
	MDPR01		9,662								
4: Sarmatian GWB	RODL04	6,356	2,178	K, F-P	No	DRW, AGR, IND	0-60	> 4,000 km²	No/ Yes	No	BG, RO
	BGBSGW01		4,178								
5: Mures / Maros	RO_MU20	6,553	2,200	P	No/Yes	DRW, IRR, IND	2-30	Important GW resource, protection of DRW res.	No/ Poss	No/ Poss	HU, RO
	RO_MU22		1,620								
	HU_P.2.12.1		1,308								
	HU_P.2.12.2		3,011								
6: Somes / Szamos	RO_SO01	2,416	1,380	P	No/Yes	DRW, AGR, IRR	5-30	Important GW resource, protection of DRW res.	No	No/ Poss	HU, RO
	RO_SO13		1,380								
	HU_P.2.1.2		976								
7: Upper Pannonian-Lower Pleistocene GWB from Backa and Banat / Dunav / Duna-Tisza köze déli r.	ROBA18	28,608	11,408	P	Yes/ Yes/ No	DRW, AGR, IND, IRR	0-30, 2-125	> 4,000 km², GW use, Important GW resource, protection of DRW res.	No/ Poss	No/ Yes	RO, CS, HU
	CS_DU10		17,200								
	HU_P.1.17.1		1,272								
	HU_P.1.17.2		1,787								
	HU_P.1.18.1		963								
	HU_P.2.10.1		2,617								
	HU_P.2.10.2		2,907								
8: Podunajska Basin, Zitny Ostrov / Szigetköz, Hanság-Rábca	SK1000300P	3,353	1,669	P	No	DRW, IRR, AGR, IND	2-5	Important GW resources, protection drinking water	Poss/ Yes	No/Yes	SK, HU
	SK1000200P		524								
	HU_P.1.1.1		876								
	HU_P.1.1.2		284								
9: Bodrog	SK1001500P	2,666	1,466	P	Yes	DRW, IRR	2-10	Important GW resource	Yes/ Poss	No	SK, HU
	HU_P2.4.2		566								
	HU_P2.5.2		734								

NAME	MS_CD	Size	National size	Aquifer characterisation		Main use	Overlying strata	Criteria for importance	Risk		bilaterally agreed with
				Aquifer Type	Confined				Quality	Quantity	
10: Slovensky kras / Aggtelek-hgs.	SK200480KF	1,069	598	K,F	Yes/ No	DRW, OTH	0-500	Protection of drinking water resources, GW dependent ecosystems (springs, caves)	No	No	SK, HU
	HU_K2.2.1		471	K							
11: Komarnanska Vysoka Kryha / Dunántúli-khgs. északi r.	SK300010FK	3,601	250	F,K	Yes/ No	DRW, SPA, CAL	0-2500	Thermal water resource	Poss	Poss	SK, HU
	SK300020FK		313								
	HU_K.1.3.1		1,445	K							
	HU_K.1.3.2.		427								
	HU_K.1.5.1		855								
	HU_K.1.5.2		311								
12: Sava**	CS_SA10		2,700	P	Yes	DRW, AGR, IND	5-20	GW use	Poss	Yes	CS, HR?

NAME	Name of the important transboundary groundwater body. Max. 100 digits, no restrictions concerning language, central European encoding (CEE), national names divided by slash
MS_CD	Member State Code which is a unique identifier. ISO-Code 2-digits & max. 22 digits. National codes from all countries sharing the GW body have to be named to identify the bodies in the respective part B (National Reports).
Size: km²	Whole area of the transboundary groundwater body covering all countries concerned in km²
National size: km²	Each country indicates the size on the national territory in km²
Aquifer characterisation	[Aquifer Type: Predom. **P** = porous/ **K** = karst/ **F** = fissured] Multiple selection possible: Predominantly porous, karst, fissured and combinations are possible. Main type listed first. [Confined: **Yes** / **No**]
Main use	[**DRW** = drinking water / **AGR** = agriculture / **IRR** = irrigation / **IND** = Industry / **SPA** = balneology / **CAL** = caloric energy / **OTH** = other] Multiple selection possible.
Overlying strata	Range in metres. Indicates a range of thickness min, max in metres.
Criteria for importance	If size < 4 000 km² criteria for importance of the GW body have to be named, they have to be bilaterally agreed upon.
Risk	Indicates whether a groundwater body is at risk of failing good status. [**Yes** = at risk / **No** = not at risk / **Poss** = possibly at risk; insufficient data/knowledge]
Bilaterally agreed with	Country which has been bilaterally agreed with has to be indicated, two digit country code after ISO 3166
Responsibility for data delivery	Indicate two digit country code after ISO 3166 and institution which is responsible for the data delivery. **AT:** Austrian Ministry for Agriculture, Forestry, Environment and Water Management. **BG:** MoEW. **DE:** Bavarian Water Management Agency. **MD:** Ministry of Ecology, Constructions and Territorial Development. **RO:** National Administration 'Apele Romane'. **SK:** Ministry of Environment Slovak Republic, Slovak Hydrometeorological Institute, Bratislava. **HU:** Ministry of Environment and Water management. CS: Ministry for agriculture, forestry and water management – Directorate for water

** The groundwater body is not bilaterally agreed yet and figures for one national part are missing. Therefore it is not included in the report (**Chapter 5**).

Descriptive information:

1: Deep Groundwater Body – Thermal Water

MS_Code	DEGK11110, ATGK100158
descriptive text on the important transboundary groundwater body	*The thermal groundwater of the Malmkarst (Upper Jurassic) in the Lower Bavarian and Upper Austrian Molasse Basin is of transboundary importance. It is used for spa purposes and to gain geothermal energy. The geothermal used water is totally re-injected in the same aquifer.* *The transboundary GW-body covers a total area of 5900 km²; the length is 155 km and the width is up to 55 km. The aquifer is Malm (karstic limestone); the top of the Malm reaches a depth of more than 1000 m below sea level in the Bavarian part and 2000 m in the Upper Austrian part. The groundwater recharge is mainly composed of subterranean inflow of the adjacent Bohemian Massif and infiltration of precipitation in the northern part of the groundwater body area. The total groundwater recharge was determined to 820 l/s. The GW-body is included in the RR because of its intensive use. An expert group takes care for the permanent bilateral exchange of information and a sustainable transboundary use.*
description of methodology for estimating the risk of failure to achieve the good status	***Quantity**: Within the framework of the Regensburg Treaty a hydro-geological model and mathematical model for the determination of the groundwater recharge were established. It could be shown that there has been no overuse up to now. An expert group worked out guidelines where joint protection and utilisation strategies are laid down. Thus a sustainable use is assured.* ***Quality**: The good status is still existing because the confined deep groundwater is well protected by thick overlying layers (several hundred meters up to more than 1000 m thick tertiary and cretaceous sediments) and reaches an age up to more than 1000 years. Therefore the thermal water is well protected from pollutants of civilisation.* *The thermal water is only used by water extractions for spa purposes and water extractions and re-injections for geothermal use. Except of the decreased temperature the re-injected thermal water is of the same quality as the extracted water. There is no other use that might cause groundwater contamination. So there is no risk that groundwater will be contaminated.* *The thermal water users / operators of geothermal plants have to carry out inspections to provide information on the thermal water quality. Yearly they have to report chemical values of the thermal water and after 5 years they have to provide authorities with an expert opinion about the development of the thermal water quality. So possible changes in the chemistry of the thermal water can be observed/detected early. Anthropogenic pollution can be excluded, changes in quality can be caused only by geogenic effects depending on water extraction.* *Up to now no significant changes of chemical values occurred.* *The groundwater body is well protected, there are no uses with a risk of groundwater pollution. So the groundwater body is not and will not be at risk.*
GW body identified as being at risk of failing to meet the objectives under Art. 4	***Quantity**: As a sustainable use is assured the transboundary GW-body is not and will not be at risk.* ***Quality**: Due to the above mentioned uses of the thermal water there is no impact on the groundwater quality. So the GW-body is not and will not be at risk*
Lower objectives identified according to Art. 4 and Annex II 2.4 and 2.5	*No*
Gaps and uncertainties in the underlying data	*No*

2: Upper Jurassic – Lower Cretaceous Groundwater Body

MS_Code	BG_DGW02 / RO_DL06
descriptive text on the important transboundary groundwater body	*Criteria for delineation is development of Upper Jurassic-Lower Cretaceous permeable deposits and water content in these deposits,* *Geological overview - The stratigraphic age is Upper Jurassic-Lower Cretaceous.* *The lithological composition is limestones, dolomitic limestones and dolomites. Overlying strata consists of marls, clays, sands, limestones, pebbles and loess. The age of the above mentioned deposits is Hauterivian, Sarmatian, Pliocene and Quaternary. Excluding small cropped out areas the GWB is very well protected. GWB main use is for drinking water supply, agriculture and industry supply.* *There is no significant impact on the GWB in both countries.* *In Romania the GWB has an interaction with Sintghiol lake situated near Black Sea. In Bulgaria an interaction exists with Srebarna lake.* *The criterion for selection as 'important' is size which exceeds 4000 km².*
description of methodology for estimating the risk of failure to achieve the good status	*The criteria and approach for quality status assessment is using of the available quality groundwater monitoring data and the existing pressure. The criteria and approach for risk assessment for quantity status is based on trend assessment.*
GW body identified as being at risk of failing to meet the objectives under Art. 4	*No risk for the quality and quantity status is detected in the both countries based on data available.*
Lower object-tives identified according to Art. 4 and Annex II 2.4 and 2.5	*In both countries there is some data for defining of the GWB structure and monitoring data for the assessment of quantity and quality status.*
Gaps and uncertainties in the underlying data	*In the future it is necessary to improve the GW monitoring network along the border between the two countries.*

3: Middle Sarmatian – Pontian Groundwater Body

MS_Code	RO_PR05/MD_PR01
descriptive text on the important transboundary groundwater body	*Criterion for delineation of the GWB was the development of the Sarmatian aquiferous deposits on the territories of Neamt, Bacau and Vaslui districts, situated in the Siret and Prut River Basins. Lithologically, the water-bearing deposits are constituted of sands and sandstones thin layer . The overlying stratum is represented by clay of about 50 meters thickness. GWB is locally used for drinking water supply. The criterion for selection as "important" is its size, which exceeds 4000 km².*
description of methodology for estimating the risk of failure to achieve the good status	*The criteria for the quality status assessment were: overlying strata for litho-protection, groundwater actual quality, pressures and their possible impacts.*

MS_Code	RO_PR05/MD_PR01
GW body identified as being at risk of failing to meet the objectives under Art. 4	*Based on available data, GWB is not at quantitative and qualitative risk.*
Lower objectives identified according to Art. 4 and Annex II 2.4 and 2.5	
Gaps and uncertainties in the underlying data	*There are relatively insufficient data for defining of the GWB structure and only some quality and piezometric levels monitoring wells.*

4: Sarmatian Groundwater Body

MS_Code	RO_DL04/BG_BSGW01
descriptive text on the important transboundary groundwater body	*Criteria for delineation are the development of Sarmatian permeable deposits and water resources in these deposits. The lithological composition of water-bearing deposits is:* *in Bulgaria: limestones, sands;* *in Romania: oollitic limestones and organogenic limestone.* *Overlying strata consists of loess and clays.* *The GWB is well protected in the clay covered areas, but is vulnerable to pollution in pre-dominantly loess and sands covered areas. This explains nitrate contamination in some areas.* *GWB main use is for drinking water supply, and also agricultural and industrial purposes.* *The main pressures are agriculture activities, waste landfills and less industrial plants.* *The GWB has an interaction with a couple of small lakes in Bulgaria. The criterion for selection as "important" is the size, which exceeds 4000 km².*
description of methodology for estimating the risk of failure to achieve the good status	*The criteria for quality status assessment are using the groundwater quality monitoring available data and existing pressures.*
GW body identified as being at risk of failing to meet the objectives under Art. 4	*Some risk for quality is detected concerning nitrate content in some monitoring sampling sites in Bulgaria. We consider achieving good quality status until 2015 possible by appropriate measures implementation.* *There is not the risk of quality concerning GWB in Romania.* *In both countries there is no detected risk for quantity status of the GWB.* *The criterion for risk assessment of quantity status is based on evolution trend determination of the groundwater piezometric levels.*
Lower objectives identified according to Art. 4 and Annex II 2.4 and 2.5	

MS_Code	RO_DL04/BG_BSGW01
Gaps and uncertainties in the underlying data	*In both countries there are some data for defining of GWB structure and monitoring data for the assessment of quantitative and qualitative status.* *In the future, it is necessary to improve the GWB monitoring network along the border between the two countries.*

5: Mures /Maros

MS_Code	RO_MU20, RO_MU22 / HU_P.2.12.1, HU_P.2.12.2
descriptive text on the important transboundary groundwater body	***RO & HU:*** *Reasons for selecting as important transboundary groundwater body* *The alluvial deposit of the Maros/Mures River is lying along both sides of the southern Hungarian-Romanian border, to the North of the actual river bed of the Maros/Mures. It is an important water resource in particular for drinking water purposes for both countries and the water abstractions influences the water availability of the other country.* ***General description*** *The basin of the east-southern part of the Great Hungarian Plain is filled up with more than 2000 m thick deposits of different ages, which is progressively thinning in Romania. The alluvial fan of the Maros/Mures River formed the Pleistocene part of the strata. The Hungarian approach does not separate vertically the multilayered aquifer system, thus the cold part of the Upper-Pannonian and the Pleistocene and the Holocene layers are vertically unified in Hungary, but divided horizontally separating the characteristic downward and transition flow system (GWB HU_P.2.12.1) from the upward one (GWB HU_P.2.12.2). In the Romanian side also two water bodies are included in the transboundary evaluation because in the Romanian method there is a separating horizon at the limit of Upper- (GWB RO_MU20) and Lower-Pleistocene (GWB RO_MU22) age of the strata. Both water bodies can be lithologically characterised by pebbles, sands and clayey interlayers, but the upper part is significantly coarser with better permeability. Virtually following the same separation in the Hungarian side, the lower 100 m of the 250 – 300 m thick Pleistocene strata is silty-sand, sandy-silt, sand and clay, and the upper part is mainly sand with gravel, so the permeability is improving towards the surface (the hydraulic conductivity of the aquifers is ranging between 5 – 30 m/day). The covering layer is mainly sandy silt and clay of 3-5 m. In the Romanian side the upper water body is unconfined and the lower is confined. In Hungary both confined and unconfined conditions occur in the southern water body and mainly confined condition is characteristic for the water body of upward flow system. The groundwater table is 2-4 m below the surface in Hungary. The main direction of the groundwater flow is from the South-East to the North-West.* *In Hungary recharge in sandy areas have only local importance (15 M m^3/year). Now, because of the considerable amount of water abstracted from the deep layers, there is a permanent recharge from shallow groundwater to the deep groundwater system (app. 15 M m^3/year) and large areas with sandy-silty covering layers contribute also to the recharge of the abstracted amount in Hungary. Another important element of the global recharge of the Hungarian part is the lateral flow across the border, estimated at 15 - 20 M m^3/d (uncertain value based on the limited available knowledge). The direction of the groundwater flow is from the recharge area to the discharge areas (main river valleys and zones with groundwater level close to the surface), i.e. from SE to N and NW.*
description of methodology for estimating the risk of failure to achieve the good status	***RO:*** *The Romanian method for the delineation leads to the following type of water bodies:* *1. The groundwater systems are vertically divided in three floors according to ages:* • *Holocene and Upper-Pleistocene (shallow) porous groundwater bodies,* • *Lower Pleistocene porous groundwater bodies,* • *Upper Pannonian porous groundwater bodies containing cold waters* • *Lower Pannonian and Pre-Pannonian (including porous, fissured and karstic) thermomineral (> 23 ^oC) and thermal (> 70 ^oC) groundwater bodies.* *2. Further separation is based on surface catchment areas in the shallow groundwater bodies, while in the case of deeper aquifers according to the development of geological formation.*

MS_Code	RO_MU20, RO_MU22 / HU_P.2.12.1, HU_P.2.12.2
	The criterion for risk assessment of quantitative status is based on evolution trend assessment of the groundwater piezometric levels. *The criteria for quality status assessment are:* • *Natural protection characteristic of the overlying strata,* • *Actual groundwater quality,* • *Pressures and their possible impact.* ***HU: Delineation of groundwater bodies** in Hungary has been carried out by:* 1. *Separation of the main geological features: porous aquifers in the basins, karstic aquifers, mixed formations of the mountainous regions, other than karstic aquifers.* 2. *Thermal water bodies are separated according to the temperature greater than 30 ^{o}C. In the case of porous aquifers it is done vertically, while in karstic aquifers horizontally. There are no thermal aquifers in the mountainous regions other than karstic.* 3. *Further division is related to the subsurface catchment areas and vertical flow system (in the case of porous aquifers) and to the structural and hydrological units (in the case of karstic aquifers and mountainous regions).* *For transboundary water bodies the more detailed further characterisation is carried out (n.b. because of the numerous transboundary water bodies and the expected further 20 - 30 % due to the risk of failing good status, Hungary decided to apply the methodology of further characterisation for all water bodies)* *The **quantitative status** is primarily evaluated by comparing the available groundwater resources and the actual groundwater abstraction (considered as valid for the coming years as well). The available groundwater resources is calculated for each groundwater body as the average recharge of the period 1991-2000 decreased by the water demand of springs, rivers in low flow period and vegetation in summer, furthermore the lateral flow from recharge to discharge area. The recharge is estimated by a national scale water balance model, while the water demands of the ecosystems are estimated in function of the morphology and groundwater flow system. Where the available information allow, area affected by decreasing groundwater levels due to groundwater abstraction are also delineated. Known requirements related to the good status of the groundwater dependent ecosystems can also be applied.* *Groundwater body is at risk from quantitative point of view, if (i) the area identified as affected by decreasing tendency of groundwater levels is larger than 20 % of the area of the groundwater body; or (ii) the actual abstraction is more than 80 % of the estimated available groundwater resources of the water body, or (iii) important groundwater dependent ecosystem is significantly damaged by anthropogenic alterations.* *Evaluation of the **chemical status** is based on the analysis of N-load from different diffuse sources (fertilizers and manure in agricultural area and in settlements as well as infiltrated communal waste water from unsewered settlements and on the assessment of hazard from point sources of pollution.* *For each groundwater body the ratio of area where higher Nitrate-concentration than 37,5 mg/l is expected until 2015. The estimated concentration corresponds to the weighted average of the upper 50 m of the water body. It is estimated in the case of different land uses (using data of 3200 settlements and information on 2,500 locations where N-balance have been established between 1999-2003, grouped into 12 types of crop and 12 agriculturally homogeneous regions).* *Data of existing monitoring in agricultural land is also used for the evaluation, if the density allows reliable identification of the areas where the weighted Nitrate-concentration of the upper 50 m greater than 37,5 mg/l. At present pollution of pesticides can not be assessed at groundwater body level.* *Water body is at risk due to diffuse sources of pollution if in 12 years the weighted concentration of the upper 50 m is greater than 37,5 mg/l in more than 20 % of the water body. The urban land use and the arable lands can be evaluated separately, in order to see their contribution.*

MS_Code	RO_MU20, RO_MU22 / HU_P.2.12.1, HU_P.2.12.2
	For the evaluation of the risk related to the point sources of pollution significant pollution sources are selected from the national database containing information on 15000 potential and existing pollution sources. Criteria for selection: hazardous substances or pollutants in large extent and soluble and mobile in water, groundwater or soil already polluted, no appropriate technical protection. A factor of hazard for each pollution sources is determined considering the hazard of the pollutants, size of the source of pollution, recharge and groundwater flow system, protection zone of groundwater abstraction sites, probability of pollution of groundwater, uncertainty of the existing information This factors of hazard can be considered as an estimate of the affected volume of groundwater, whom the average concentration after 12 years is equal to a threshold value. *The water body is at risk because of point sources of pollution, if the sum of the affected volumes is larger than 20 % of the total volume of the upper 50 m of the water body.* *The overall risk corresponding to the achievement of chemical status is determined based on the sum of the affected volume determined for both point and diffuse sources of pollution. In the case of diffuse pollution the volume can be estimated from the ratio of area, considering the 50 m thick upper part of the water body.* *The water body is considered at risk, if the sum of the affected volume corresponding to point and diffuse sources is larger than 20 % of the total volume of the upper 50 m of the water body.* *As a result of the risk assessment, the groundwater bodies in Hungary will be classified in one of the four classes:* *1. The good status can be achieved in 2015 (based on reliable, sufficient information).* *2. Achievement of the good status is at risk (based on reliable, sufficient information).* *3. Achievement of the good status is possibly at risk (the available information suggests risky situation, but the decision is not obvious either because the reliability of the data, or the uncertainty of the methodology),* *4. Decision is not possible, because the uncertainty of the available information (insufficient data and knowledge) makes larger interval of the possible results than acceptable, i.e., any of the above 3 types decision can be taken.* ***RO & HU: Major pressures and impacts*** *In Hungary the actual abstraction is around 30 Mm^3/year, which is used mainly for drinking water (app. 350 thousand people are supplied from that source) and irrigation, but there is some water demand of the industry and animal farms as well. 110 shallow and 35 deep observation wells are available in the Hungarian part, the majority with sufficiently long observation period for trend analysis. There is no evidence whether the groundwater abstraction or the dry period is the cause of observed slight declining trend in some wells.* *In the Hungarian part, the drinking water supply is facing to a considerable quality problem due to the naturally high arsenic, iron, manganese and ammonium content of the water.* *Arable lands cover the majority of the area, where the use of chemicals and manure endangers the quality of the groundwater, since the upper water body in Romania and the majority of the southern water body (HU_P.2.12.1) in Hungary is vulnerable against surface originated pollutions.* *In this Hungarian region 70 kg/ha Nitrogen is used in the arable lands in the form of fertilizer and from that low amount no surplus Nitrogen is occurring. Use of animal manure involves a further 12 kgN/ha. The infiltrated communal waste water contribute to the Nitrogen-load with 170 t, but its impact on the overall area is insignificant. Eight significant point sources of pollution were found in the region.* *In Hungary out of the 36 monitoring wells in arable land, 4 show higher maximum Nitrate-content than 50 mg/l, and a further 5 maximum content range between 25 and 50 mg/l. Nitrate content of the groundwater under settlements is generally higher than 50 mg/l.*

MS_Code	**RO_MU20, RO_MU22 / HU_P.2.12.1, HU_P.2.12.2**
GW body identified as being at risk of failing to meet the objectives under Art. 4	*In Romania there is no detected risk neither for quantitative nor for qualitative status.* *In Hungary the available groundwater resource is in the range of 20 - 40 Mm^3/year depending on the amount of the lateral flow from Romania (15 - 20 Mm^3/year) and the water demand of the groundwater dependent ecosystems (10 - 25 Mm^3/year). The uncertainty is very large and comparing with the actual abstracted amount (30 M m^3/year) the range of the use ratio can be from 0.75 (not at risk) to 1.5 (at risk). So, the classification is not reliable, therefore more detailed assessment is needed. To be noted, that the additional recharge highly depends on meteorological conditions and therefore the situation is very sensitive to droughts. The trend analysis of the water level time series is also uncertain, because it is difficult to separate the impact of the abstraction from that of the variation of climate.* *The point sources of pollution do not represent risk, since the total risk-factor is 0.007, much less than the threshold value.* *The smaller water body in Hungary (HU_P.2.12.1) is entirely Nitrate-sensitive area. The preliminary risk assessment for diffuse Nitrate-sources shosw that in this part of the water body nitrate-pollution exceeding the threshold value from diffuse sources (settlements, agricultural areas) covers more than 20 % of the water body. In the water body charac-terised by upward flow, the Nitrogen-load is similar, but the danger is lower. For final classification, further analysis is needed, thus the water body complex is "possibly at risk".* *Four nature conservation areas are in the region where the groundwater status is considered as important for the vegetation. Their actual status is fitting to the requirements of the ecosystems to be protected.*
Lower objectives identified according to Art. 4 and Annex II 2.4 and 2.5	*No lower objective is needed.*
Gaps and uncertainties in the underlying data	*The estimation of the available groundwater resources is uncertain. A common (Hungarian, Romanian) research is necessary to specify the amount of lateral flow from Romania to Hungary taking into account the planned water abstraction in Romania and to estimate more precisely the water demand of the groundwater dependent ecosystems.*

6: Somes / Szamos (only Romanian part)

MS_Code	**RO_SO01, RO_SO13 / HU_P.2.1.2**
descriptive text on the important transboundary groundwater body	*RO & HU**: Reasons for selecting as transboundary groundwater body*** *The alluvial deposit of the Somes/Szamos River extends on both sides of the northern part of the Hungarian-Romanian border. It is also connected to the aquifer system lying in Ukraine close to the borders. The aquifer system supplies drinking water to a population of about 400,000 inhabitants in Romania and 50,000 inhabitants in Hungary. In the Hungarian side due to the lowland character and the upward flow system, the terrestrial ecosystems need surplus transpiration from the groundwater; 7 % of the area of the water body is under nature conservation. The recharge zone is in Romania and in Ukraine, thus the available groundwater resource and the status of the terrestrial ecosystems in the Hungarian side depend on the lateral flow from the neighbouring countries. In the following the Romanian and the Hungarian part of the water body complex will be described.* ***General description*** *The Somes/Szamos River has formed a 30 - 250 m thick alluvial deposit This Holocene-Pleistocene formation is divided vertically in Romania by the horizon separating the Upper- and Lower-Pleistocene strata. In Romania two water bodies are considered, overlapping*

MS_Code	**RO_SO01, RO_SO13 / HU_P.2.1.2**
	each other, covering a surface of 1440 km^2. According to the Hungarian approach of delineation, the cold part of the Upper-Pannonian and the Pleistocene and Holocene layers are vertically unified. The Hungarian part can be characterised only by upward flow system, thus no further horizontal separation is applied. The area covered by the water body is 976 km^2. *In Romania, the shallow (Holocene-Upper-Pleistocene) aquifer is unconfined, consisting of sands, argillaceous sands, gravels and even boulders in the eastern part, and has a depth of 25 - 35 m. The silty-clayey covering layer is 5 - 15 m thick.* *The deeper (Lower-Pleistocene) aquifer is confined (it is separated from the Upper-Pleistocene part by a clay layer); its bottom is declining from 30 m to 130 m below the surface from East to West. The gravely and sandy strata (characteristic to westwards from Satu-Mare town) represent the main aquifer for water supply in the region.* *In Hungary (as part of the cold water body, the Quaternary (Pleistocene) and the Holocene strata are 50 m thick at the Ukrainian border and its continuously declining bottom is around 200 m bellow the surface at the western boundary. Mainly confined conditions characterise the Hungarian part, with a silty clayey covering layer of 5 – 30 m (increasing from the NE to the SW). The quaternary aquifer is sand or gravely sand, and the hydraulic conductivity is ranging between 10 - 30 m/d. To be noted that the Hungarian water body includes the cold water bearing part of the Pannonnian formation as well, to the depth of 400 - 450 m (below this level thermal water of more than 30 ^{o}C temperature can be found).* *Depth of the groundwater level (mainly pressure in confined area) below the surface is ranging between 2 and 5 m in Hungary. The flow direction is from the NEE to the SWW in both countries, corresponding to the recharge and main discharge zones (rivers and area with groundwater level close to the surface).* *The recharge area is in the Romanian part of the water body (and in Ukraine). In Hungary the infiltrated amount from the local recharge zones are supplying the neighbouring discharge zones and can not be considered as part of the available groundwater resources.*
description of methodology for estimating the risk of failure to achieve the good status	*See also Body 5* *RO & HU**: Major pressures and impacts*** *In Romania two large groundwater abstraction sites provide 33 Mm^3/year of drinking water (in Satu-Mare area 64 wells, 25 Mm^3/year and between Satu-Mare and Carei town 32 wells 8 Mm^3/year). Other abstractions for smaller waterworks and for irrigation.* *In Hungary 5 Mm^3/year is abstracted for different purposes, mainly for drinking water.* *In Romania, the groundwater monitoring network in the alluvial fan of Somes River includes 98 observation wells for the shallow aquifer, while about 20 monitoring wells provide water level measurements in the Hungarian side. Continuous declining trend is not observed neither in Hungary nor in Romania.* *Arable land is the main land use in both countries. In the Hungarian region 86 kg/ha Nitrogen fertilizer is applied, and surplus Nitrogen from that source is estimated at 20 kgN/ha. The animal manure adds a further 22 kgN/ha. In the unsewered settlements app. 90 t N is infiltrating with the wastewater into the groundwater, but it is insignificant at water body level. The inventory has registered five significant point sources of pollution. Ammonium in some wells exceeds the drinking water standard.* *In Hungary 7 wells are available for regular quality monitoring. Additional wells used for nitrate-survey in the arable land have not shown nitrate pollution. Groundwater under settlements are generally polluted.*
GW body identified as being at risk of failing to meet the objectives under Art. 4	*No quantitative risk is assessed in the Romanian side.* *(In Hungary the 5 Mm^3/year abstracted amount is compared to the estimated available groundwater resources. The overall recharge of the Hungarian groundwater body mainly depends on the lateral flow from Romania and Ukraine, which is uncertain. The water demand of the ecosystems is estimated at 8 - 15 Mm^3/year.*

MS_Code	**RO_SO01, RO_SO13 / HU_P.2.1.2**
	In Romania, the deeper confined aquifer is naturally protected against surface pollution. In the shallow aquifer, ammonium-content exceeding the drinking water standard value appears in some observation wells, but this problem exists in less than 30 % of the wells and generally isolated. In conclusion, the upper Romanian groundwater body also not at risk. *In Hungary, despite the considerable diffuse Nitrogen-load from fertilizer and from manure, the real pressure, i.e. the expected polluted area above the threshold is small, because the upward flow system, providing natural protection against deep penetration, even if the shallow part of the groundwater is polluted. The point sources of pollution do not represent risk, since the total risk-factor is insignificant (around 0.004).* *Considering all the above information together, it can be concluded, that the Hungarian water body is also not at risk from chemical point of view.* *Four nature conservation areas are in the region where the groundwater status is considered as important for the vegetation. Their actual status is fitting to the special requirements, no significant damage is registered.*
Lower objectives identified according to Art. 4 and Annex II 2.4 and 2.5	*No need for lower objectives.*
Gaps and uncertainties in the underlying data	*More information is needed about the lateral flow from Ukraine and a more precise estimation of the water demand of the groundwater dependent ecosystem is required.* *Although the pressure from the diffuse sources of pollution was assessed as not significant, more information is needed about their real impact; development of the actual monitoring is necessary.*

7: Upper Pannonian-Lower Pleistocene GWB from Backa and Banat / Dunav / Duna-Tisza köze déli r.

MS_Code	**ROBA18 / CS_DU10 / HU_P.1.17.1, HU_P.1.17.2, HU_P.1.18.1, HU_P.2.10.1, HU_P.2.10.2**
descriptive text on the important transboundary groundwater body	***RO:*** *Criterion for delineation of this regional body was the development of fluvial-lacustrine Pannonian-Pleistocene aquiferous deposits, in the Bega and Timis River Basins. Lithologically, the water-bearing deposits are constituted of thin layers with fine towards medium grain-size (sands, rarely gravels), sometimes with lens aspect, situated at depth of 30 - 350 m.* *The overlying strata are predominantly represented by detritic Quaternary deposits.* *GWB is mainly used for drinking water supply, agricultural and industrial supplies.* *The criterion for selection as "important" consists in its size that exceeds 4000 km².* ***CS:*** *The criteria for the identification of this group of water bodies were the following:* ❑ *Effective porosity of the aquifers;* ❑ *Permeability and transmissivity of the aquifers;* ❑ *Continuity of areal extent;* ❑ *Quantitative and chemical status of the groundwater body;* ❑ *Importance of the water body to municipal and industrial water supply.* ***HU:*** *Delineation of groundwater bodies in Hungary has been carried out by:* *1. Separation of the main geological features: porous aquifers in the basins, karstic aquifers, mixed formations of the mountainous regions, other than karstic aquifers.*

MS_Code	ROBA18 / CS_DU10 / HU_P.1.17.1, HU_P.1.17.2, HU_P.1.18.1, HU_P.2.10.1, HU_P.2.10.2
	2. *Thermal water bodies are separated according to the temperature greater than 30 ºC. In the case of porous aquifers it is done vertically, while in karstic aquifers horizontally. There are no thermal aquifers in the mountainous regions other than karstic.* 3. *Further division is related to the subsurface catchment areas and vertical flow system (in the case of porous aquifers) and to the structural and hydrological units (in the case of karstic aquifers and mountainous regions).* *For transboundary water bodies the more detailed further characterisation is carried out (n.b. because of the numerous transboundary water bodies and the expected further 20 - 30 % due to the risk of failing good status, Hungary decided to apply the methodology of further characterisation for all water bodies)*
description of methodology for estimating the risk of failure to achieve the good status	***RO:*** *The criteria for the quality status assessment were: overlying strata for litho-protection, groundwater actual quality, pressures and their possible impacts.* ***CS:*** *The groundwater status assessment (quantitative and chemical) will involve several steps:* ❑ *Collection and mapping of major diffuse and point sources, and abstraction and discharge points* ❑ *Preparation of groundwater body vulnerability maps;* ❑ *Identification of dependent surface water bodies and dependent terrestrial ecosystems;* ❑ *Use of monitoring data for the determination of trends of groundwater level and chemical status variation;* ❑ *Risk assessment to determine whether the groundwater body is at risk of failing to meet Article 4 status objectives;* ❑ *Comparison with and verification of groundwater status assessments against available monitoring data;* ❑ *Combining the chemical risk assessment outcome with the quantity risk assessment outcome to define the overall risk, the end result being the lower of the two.* ***HU:*** *The quantitative status is primarily evaluated by comparing the available groundwater resources and the actual groundwater abstraction (considered as valid for the coming years as well). The available groundwater resources is calculated for each groundwater body as the average recharge of the period 1991-2000 decreased by the water demand of springs, rivers in low flow period and vegetation in summer, furthermore the lateral flow from recharge to discharge area. The recharge is estimated by a national scale water balance model, while the water demands of the ecosystems are estimated in function of the morphology and groundwater flow system. Where the available information allow, area affected by decreasing groundwater levels due to groundwater abstraction are also delineated. Known requirements related to the good status of the groundwater dependent ecosystems can also be applied.* *Groundwater body is at risk from quantitative point of view, if (i) the area identified as affected by decreasing tendency of groundwater levels is larger than 20 % of the area of the groundwater body; or (ii) the actual abstraction is more than 80 % of the estimated available groundwater resources of the water body, or (iii) important groundwater dependent ecosystem is significantly damaged by anthropogenic alterations.* *Evaluation of the chemical status is based on the analysis of N-load from different diffuse sources (fertilizers and manure in agricultural area and in settlements as well as infiltrated communal waste water from unsewered settlements and on the assessment of hazard from point sources of pollution.* *For each groundwater body the ratio of area where higher Nitrate-concentration than 37,5 mg/l is expected until 2015. The estimated concentration corresponds to the weighted average of the upper 50 m of the water body. It is estimated in the case of different land uses (using data of 3200 settlements and information on 2,500 locations where N-balance have been established between 1999-2003, grouped into 12 types of crop and 12 agricultural homogeneous regions).*

MS_Code	ROBA18 / CS_DU10 / HU_P.1.17.1, HU_P.1.17.2, HU_P.1.18.1, HU_P.2.10.1, HU_P.2.10.2
	Data of existing monitoring in agricultural land is also used for the evaluation, if the density allows reliable identification of the areas where the weighted Nitrate-concentration of the upper 50 m greater than 37,5 mg/l. At present, pollution of pesticides can be assessed only at national level. *Water body is at risk due to diffuse sources of pollution if in 12 years the weighted concentration of the upper 50 m is greater than 37,5 mg/l in more than 20 % of the water body's area. The urban land use and the arable lands can be evaluated separately, in order to see their contribution.* *For the evaluation of the risk related to the point sources of pollution significant pollution sources are selected from the national database containing information on 15000 potential and existing pollution sources. Criteria for selection: hazardous substances or pollutants in large extent and soluble and mobile in water, groundwater or soil already polluted, no appropriate technical protection. A factor of hazard for each pollution sources is determined considering the hazard of the pollutants, size of the source of pollution, recharge and groundwater flow system, protection zone of groundwater abstraction sites, probability of pollution of groundwater, uncertainty of the existing information This factors of hazard can be considered as an estimate of the affected volume of groundwater, whom the average concentration after 12 years is equal to a threshold value.* *The water body is at risk because of point sources of pollution, if the sum of the affected volumes is larger than 20 % of the total volume of the upper 50 m of the water body.* *The overall risk corresponding to the achievement of chemical status is determined based on the sum of the affected volume determined for both point and diffuse sources of pollution. In the case of diffuse pollution the volume can be estimated from the ratio of area, considering the 50 m thick upper part of the water body.* *The water body is considered at risk, if the sum of the affected volume corresponding to point and diffuse sources is larger than 20 % of total volume of the upper 50 m of the water body.* *As a result of the risk assessment, the groundwater bodies in Hungary will be classified in one of the four classes:* 1. *The good status can be achieved in 2015 (based on reliable, sufficient information).* 2. *Achievement of the good status is at risk (based on reliable, sufficient information).* 3. *Achievement of the good status is possibly at risk (the available information suggests risky situation, but the decision is not obvious either because the reliability of the data, or the uncertainty of the methodology),* 4. *Decision is not possible, because the uncertainty of the available information (insufficient data and knowledge) makes larger interval of the possible results than acceptable, i.e., any of the above 3 types of decision can be taken.*
GW body identified as being at risk of failing to meet the objectives under Art. 4	***RO:*** *Based on available data, GWB is not at quantitative and qualitative risk.*
Lower objectives identified according to Art. 4 and Annex II 2.4 and 2.5	
Gaps and uncertainties in the underlying data	***RO:*** *There are almost sufficient data for defining of GWB structure and few quality and piezometric levels monitoring wells*

8: Podunajska Basin, Zitny Ostrov / Szigetköz, Hanság-Rábca

MS_Code	**SK1000300P, SK1000200P / HU_P.1.1.1, HU_P.1.1.2**
descriptive text on the important transboundary groundwater body	***SK:*** *Delineation of water bodies in Slovakia consists of the following steps:* *3. The aquifers are vertically divided in three floors: Quaternary sediments, Pr-quaternary strata containing cold waters, thermal aquifers (temperature > 25 ^oC or it is considered as thermal by classification).* *4. The pre-quaternary strata are further divided horizontally by geological types of the aquifer: volcanic rocks, other fissured rocks, karstic rocks, porous sediments.* *5. Further separation is due to the borders of the surface catchment areas considered as river basin management units.* ***HU:*** *Delineation of groundwater bodies in Hungary has been carried out by:* *4. Separation of the main geological features: porous aquifers in the basins, karstic aquifers, mixed formations of the mountainous regions, other than karstic aquifers.* *5. Thermal water bodies are separated according to the temperature greater than 30 ^oC. In the case of porous aquifers it is done vertically, while in karstic aquifers horizontally. There are no thermal aquifers in the mountainous regions other than karstic.* *6. Further division is related to the subsurface catchment areas and vertical flow system (in the case of porous aquifers) and to the structural and hydrological units (in the case of karstic aquifers and mountainous regions).* *For transboundary water bodies the more detailed further characterisation is carried out (n.b. because of the numerous transboundary water bodies and the expected further 20 – 30 % due to the risk of failing good status, Hungary decided to apply the methodology of further characterisation for all water bodies).*
	Reasons for selecting as important transboundary groundwater body *The large alluvial deposit of the River Danube downstream Bratislava lies in three countries: Slovakia (Podunajská lowland and its part: Žitný ostrov), Hungary (Northern part of Kisalföld including the Szigetköz) and in Austria. The aquifer system has been considered by Slovakia and Hungary as an important transboundary aquifer because of (i) its size, (ii) the unique amount of available groundwater resource and the important actual use for drinking water and other purposes as well (iii) the groundwater dependent terrestrial ecosystem of the floodplain, (iv) majority of the area is protected (protection zones of drinking water abstraction sites, nitrate sensitive areas, nature conservation areas), (v) the existence of the Gabcikovo Hydropower System. Parts lying in these two countries will be described in the following.* ***General description*** *The Danube has been playing the decisive role in the formation of the aquifer system. The main aquifer is made up of 15-500 m thick Quaternary alluvia: hydraulically connected mixture of sands, gravels, intercalated with numerous clay and silt lenses. The average hydraulic conductivity is in the range of 100 – 500 m/day providing extremely high transmissivity, especially in the centre of the basin. Here, the bottom of the underlying Pannonian deposits is at a depth of 3500 m.* *The aquifer is divided into several groundwater bodies in both countries. Despite the differences in the delineation method of the two countries, it was possible to select the relevant water bodies from transboundary point of view: two water bodies containing cold water in Hungary, which beside the Quaternary strata include some part of the Upper-Pannonian deposits as well, to the depth of 400 - 500 m corresponding to the surface separating cold and thermal waters (1160 km^2) and two Quaternary water bodies in Slovakia (2193 km^2) have been selected, i.e. 3353 km^2 in total (see the summary table above).* *The aquifer can be considered as unconfined, despite the considerable area where the water level is in the semi-permeable covering layer.* *Due to the high transmissivity of the aquifer, the groundwater regime and groundwater quality mainly depend on the surface water. The flow system and the type of covering layer provide surplus recharge condition in the majority of the area, but the main source of*

MS_Code	SK1000300P, SK1000200P / HU_P.1.1.1, HU_P.1.1.2
	groundwater recharge is the Danube. Before the construction of the hydropower system (1992), the riverbed had been the infiltration surface, and the Danube's line had been the hydraulic boundary between the countries as well (in upper parts of Danube stream between Devín and Hrušov, approximately since 1970's, river bed started to drain groundwater). In the actual situation, the artificial recharge system is the main source for the vicinity of the Danube, but a remaining part of the aquifers in the Hungarian territory is recharged by the Čunovo reservoir. Where the reservoir is in the neighbourhood of the main channel (between Rajka and Dunakiliti) considerable transboundary groundwater flow appears under the Danube. The Danube's river bed downstream the reservoir – due to the derived flow and the consequently decreased average water level - drains the neighbouring groundwater, causing considerable drop of groundwater level in the imminent vicinity of the river bed. Both the quantity and the quality of the recharge from the reservoir highly depend on the continuously increasing deposit in the reservoir and the developing physico-chemical processes. Deposits in the reservoir are extracted. Signs of long-term changes of quantity and quality of recharge caused by continuously increasing deposit in the reservoir were not observed in the Slovak part of the aquifer yet. *The depth of the groundwater table varies between 2 and 5 m. The wetting conditions of the covering layer has substantially changed along the Danube and in the lower Szigetköz, where prior to the derivation of the Danube the groundwater has fluctuated in the covering layer and the existing artificial recharge system does not compensate sufficiently the former influence of the Danube. On the Slovak territory, annual artificial flooding of the river system in the high water periods seems to efficiently supply groundwater as well as the soil moisture resources.* ***Major pressures and impacts*** *As a result of the favourable hydro-geological conditions, large amount of groundwater is abstracted in both countries. The actual abstraction is 19.5 Million and 75.7 Million m^3/year respectively in Hungary and in Slovakia. The groundwater is mainly used for drinking water and irrigation. On the Slovak side, water supply from this area covers almost all the water demand of Bratislava area, which means about 500 000 inhabitants. In Hungary 220 000 people are supplied from that source. The area is considered as important future water resources as well. The estimated total available groundwater resource (including forced bank filtration) is about 600 Mm^3/y in Slovakia and approximately 300 Mm^3/y in Hungary, suitable for supplying large regional pipeline system, which can provide healthy drinking water beyond the region as well.* *The groundwater level monitoring is very much extended in both countries. In Hungary around 330 monitoring wells (out of app. 10 % medium and deep wells) provide water level time series. Piezometric levels are monitored on 320 monitoring wells in Slovakia, where approximately 30% of time series data reaches 40 years of not interrupted monitoring. This amount of data is sufficient for analysing all changes and tendencies.* *Vegetation of the Danube's floodplain consists mainly of forest, which has been largely influenced by the depth of groundwater table. Since close to the Danube the original level and fluctuation has not yet been restored by measures, this part of the water body needs special attention in the future, focusing on the determination of appropriate criteria of the ecosystem and the monitoring. No trend due to groundwater abstraction has been detected in the Hungarian side.* *The groundwater quality is influenced by various factors such as surface waters connected to the aquifer, household wastes from settlements, but also contaminants from stockyards and from agricultural practices, since the region is important agricultural area in both countries. In geologically vulnerable area a few settlements without sewage system must be considered as potential source of pollution as well.* *8 significant point sources of pollution can be accounted from the Hungarian national database. The nitrogen fertilizer use is 80 kgN/ha, and together with the 16 kg N/ha manure it leads to an average surplus-Nitrogen of 4 kg N/ha/year. In the settlements without sewer system 160 t Nitrogen is infiltrated to the groundwater, which result polluted groundwater under the settlements, but do not endanger the whole groundwater body.* *Water quality monitoring has been installed in both countries. In Hungary, the monitoring programme includes 130 wells, which are observed 1-4 times per year for regular*

MS_Code	SK1000300P, SK1000200P / HU_P.1.1.1, HU_P.1.1.2
	components. In Slovakia the monitoring programme in this area is subdivided into basic programme (15 multi-levelled monitoring sites with the frequency of sampling 4 times per year) and supplementary programme (19 sampling sites with the frequency of sampling 2 times per year). *It is valid for both countries that lower levels of dissolved oxygen (indicating reducing conditions) cause relatively high concentrations of iron and manganese. Exceeded limit values of organic substances in Slovakia occur only sporadically (nonpolar extractable substances, 1,1-dichloroethane).* *In the eastern part of Hungary, in the vicinity of the Austrian border the monitoring wells show higher Nitrate-concentration than 50 mg/l. The extension is not known exactly, but the similar pollution in the Austrian side and the direction of the flow (from Austria to Hungary) makes evident that the trend is increasing.* *In Slovakia the area is a protected water management area. The high vulnerability and the intensive water abstraction and agricultural activities require high level of protection of the available resources. In Hungary the entire area is nitrate-sensitive, 12 % belong to protected zones of vulnerable drinking water abstraction sites, and 15 % to nature conservation areas.*
description of methodology for estimating the risk of failure to achieve the good status	***SK:*** *To evaluate the quantitative status of GWB and to estimate the risk of failure of achieving good quantitative status, two mainstream approaches were applied:* *(1) COMPLEX SETTING OF THE RATIO OF ACCEPTABLE WITHDRAWALS LOAD FROM THE AVAILABLE GROUNDWATER RESOURCES WITHIN GROUNDWATER BODIES.* *Data of the State water management balance of groundwater for pertinent GWB - available groundwater resources and data on groundwater withdrawal are used. The available groundwater resources are determined either according to the hydrological balance of the area, or on the basis of documented groundwater sources inventory (pumping tests in the wells, long-term data about spring discharges). Data on groundwater withdrawals are based on the state database of realized withdrawals according to the applicable legislation (registration of withdrawals over 1250 m^3 per months, 9000 points).* *Groundwater body is at risk to reach good quantitative status if :* - *the annual groundwater withdrawals during last 5 years for the whole GWB exceed 50 % of the documented available groundwater resources;* *or* - *inside of GWB there are localities with groundwater abstraction more than 85% of documented groundwater sources (ecological aspect of abstraction) .* *(2) TREND ANALYSES OF MONITORED GROUNDWATER TABLE LEVELS WITHIN GROUNDWATER BODIES AND ASSESSMENT OF POTENTIAL DECREASING TRENDS,* *Groundwater body is also at risk to reach good quantitative status if :* - *the linear trend evaluation of long term monitoring data of groundwater regime show important decreasing trend and in the same time there is documented influence on the dependent ecosystems.* *The evaluation of chemical status and estimating the risk of failure to achieve good status of GWB were based on :* ▪ *Evaluation of present qualitative status of groundwater* ▪ *Determination of potential risk owing to which groundwater does not reach "good chemical status"* *Evaluation of present qualitative status of groundwater in Slovakia is realized according to the chemical composition of groundwater consisted of 16 359 analyses (statistical density of sampling was 3 samples/1 km^2) divided into the delineated groundwater bodies. As quality criterium a "contamination index" is selected (Backman-Bodiš-Lahermo-Rapant-Tarvainen, 1998), which were calculated for each analysed component that exceed limit value of National Dinking Water Standard. For calculation of contamination index of each sample, the following input indicators of groundwater were used: total dissolved solids (TDS), NO_3, Cl, SO_4, As, F, Cd, Cu, Cr, Pb, Hg, Se, NH_4, Al, Mn, Zn, Fe, Na and Sb.*

MS_Code	SK1000300P, SK1000200P / HU_P.1.1.1, HU_P.1.1.2
	Potential risk of delineated groundwater bodies is estimated on the basis of evaluation of potential impacts of diffuse and point sources of pollution and groundwater vulnerability. Particular information layers are: ▪ *Land use classes (Corine Land Cover)* ▪ *Point sources of contamination (GeoEnviron system)* ▪ *Present groundwater quality map of Slovakia* ▪ *Map of groundwater vulnerability* *For estimation of potential risk from <u>diffuse sources</u> of contamination classification of land use classes is used. Map of loads is combined with vulnerability map.* *Evaluation of potential risk from <u>point sources</u> for whole area of Slovakia is based on a complex methodology, processed by GeoEnviron system by means of final risk score. Sum of groundwater risk was determined based on the final risk scores. Database of this system contains the following data sources (7764 sites) - database of landfills and point sources of pollution.* *Cumulative potential risk map from <u>diffuse and point sources</u> is compared with present groundwater quality map of Slovakia.* *Groundwater body is at risk to reach good qualitative status if :* ▪ *poor groundwater quality according to the map of present qualitative status* ▪ *moderate and high potential cumulative risk of point and diffuse sources of pollution according to they potential impact and properties of aquifer (vulnerability).* *Independent potential risk point sources of pollution are located in moderate and highly vulnerable environment and show high potential impact on groundwater, whereas are not located in higher defined areas. While identification of groundwater bodies at risk, at risk is water body with following criteria:* • *Potential area of pollution for one point source is 79 km^2 (by 5 km radius of potentially polluted area around point source)* *Allowed number of point sources in gw body = (gw body area / 79).0,5* ***HU:** The quantitative status is primarily evaluated by comparing the available groundwater resources and the actual groundwater abstraction (considered as valid for the coming years as well). The available groundwater resources is calculated for each groundwater body as the average recharge of the period 1991-2000 decreased by the water demand of springs, rivers in low flow period and vegetation in summer, furthermore the lateral flow from recharge to discharge area. The recharge is estimated by a national scale water balance model, while the water demands of the ecosystems are estimated in function of the morphology and groundwater flow system. Where the available information allow, area affected by decreasing groundwater levels due to groundwater abstraction are also delineated. Known requirements related to the good status of the groundwater dependent ecosystems can also be applied.* *<u>Groundwater body is at risk from quantitative point of view, if (i) the area identified as affected by decreasing tendency of groundwater levels is larger than 20 % of the area of the groundwater body; or (ii) the actual abstraction is more than 80 % of the estimated available groundwater resources of the water body, or (iii) important groundwater dependent ecosystem is significantly damaged by anthropogenic alterations.</u>* *Evaluation of the chemical status is based on the analysis of N-load from different diffuse sources (fertilizers and manure in agricultural area and in settlements as well as infiltrated communal wastewater from unsewered settlements and on the assessment of hazard from point sources of pollution.* *For each groundwater body the ratio of area where higher Nitrate-concentration than 37,5 mg/l is expected until 2015. The estimated concentration corresponds to the weighted average of the upper 50 m of the water body. It is estimated in the case of different land uses (using data of 3200 settlements and information on 2500 locations where N-balance has been established between 1999-2003, grouped into 12 types of crop and 12 agricultural homogeneous regions).*

MS_Code	SK1000300P, SK1000200P / HU_P.1.1.1, HU_P.1.1.2
	Data of existing monitoring in agricultural land is also used for the evaluation, if the density allows reliable identification of the areas where the weighted Nitrate-concentration of the upper 50 m greater than 37,5 mg/l. At present pollution of pesticides can be assessed only at national level. *<u>Water body is at risk due to diffuse sources of pollution if in 12 years the weighted concentration of the upper 50 m is greater than 37,5 mg/l in more than 20 % of the water body's area.</u> The urban land use and the arable lands can be evaluated separately, in order to see their contribution.* *For the evaluation of the risk related to the point sources of pollution significant pollution sources are selected from the national database containing information on 15000 potential and existing pollution sources. Criteria for selection: hazardous substances or pollutants in large extent and soluble and mobile in water, groundwater or soil already polluted, no appropriate technical protection. A factor of hazard for each pollution sources is determined considering the hazard of the pollutants, size of the source of pollution, recharge and groundwater flow system, protection zone of groundwater abstraction sites, probability of pollution of groundwater, uncertainty of the existing information. This factor of hazard can be considered as an estimate of the affected volume of groundwater, whom the average concentration after 12 years is equal to a threshold value.* *<u>The water body is at risk because of point sources of pollution, if the sum of the affected volumes is larger than 20 % of the total volume of the upper 50 m of the water body.</u>* *The overall risk corresponding to the achievement of chemical status is determined based on the sum of the affected volume determined for both point and diffuse sources of pollution. In the case of diffuse pollution the volume can be estimated from the ratio of area, considering the 50 m thick upper part of the water body.* *<u>The water body is considered at risk, if the sum of the affected volume corresponding to point and diffuse sources is larger than 20 % of the total volume of the upper 50 m of the water body.</u>* *As a result of the risk assessment, the groundwater bodies in Hungary will be classified in one of the four classes:* *1. The good status can be achieved in 2015 (based on reliable, sufficient information).* *2. Achievement of the good status is at risk (based on reliable, sufficient information).* *3. Achievement of the good status is possibly at risk (the available information suggests risky situation, but the decision is not obvious either because the reliability of the data, or the uncertainty of the methodology),* *Decision is not possible, because the uncertainty of the available information (insufficient data and knowledge) makes larger interval of the possible results than acceptable, i.e., any of the above 3 types of decision can be taken.*
GW body identified as being at risk of failing to meet the objectives under Art. 4	*The actual abstraction from the groundwater is much less than the estimated available groundwater resource. The use ratio is only 12 - 13 % in Slovakia and 7 % in Hungary. From groundwater abstraction point of view the water bodies are not at risk in both countries.* *Even if the water balance shows globally a good quantitative status, according to Hungary the present groundwater table and fluctuation does not meet the requirements of the ecosystem characterising the period prior the damming. Referring to the WFD's general criteria of the good quantitative status regarding groundwater dependent ecosystems, the water body is considered at risk.* *According to risk assessment results, groundwater quantitative status is not at risk on Slovak side, also groundwater dependent ecosystems are not reported to be under the threat on the Slovak side – as explained by some previous comments.* *In part of Podunajská lowland (Žitný ostrov and the right part of Danube River) the bodies of Quaternary sediments from aspect of chemical status are divided into two groups: groundwaters with poor chemical status in upper part and with good chemical status in deeper parts. Main contaminants in case of upper part are nitrates; iron and manganese do to prevailing reducing conditions and present of potentially risk diffuse sources.*

MS_Code	SK1000300P, SK1000200P / HU_P.1.1.1, HU_P.1.1.2
	In Hungary, the point sources of pollution don't make the water body "at risk" since the potentially affected volume of water is 8 % of the total volume of the upper 50 m (the threshold is 20 %). Although the actual use of fertilizers is decreasing and do not endanger large area, the water body is at risk from the chemical status point of view, due to the Nitrate-pollution originating from Austria. *An additional element of the chemical risk is related to the insufficient knowledge on the long-term impact of the reservoir on groundwater quality, which is still uncertain and can influence the water quality of large volume of groundwater. Until the uncertainty is not eliminated by sufficiently long monitoring, achievement of the good status would not be reliably declared.*
Lower objectives identified according to Art. 4 and Annex II 2.4 and 2.5	*No lower objective is necessary at the moment.*
Gaps and uncertainties in the underlying data	*In Hungary the data provided by the qualitative monitoring are considered as not sufficiently long for estimating future impacts of the clogging reservoir.* *Considering the requirements of the groundwater dependent ecosystems (surplus water for transpiration) close to the natural river bed of the Danube, analysis of the optimal fluctuation of the groundwater level – corresponding to good ecological status of the groundwater dependent terrestrial ecosystem – is also required.*

9: Bodrog

MS_Code	SK1001500P / HU_P2.4.2, HU_P2.5.2
descriptive text on the important transboundary groundwater body	***Delineation**: see Body 8* ***Reasons for selecting as important transboundary groundwater body*** *At the common eastern border of Slovakia and Hungary, the alluvial aquifer system corresponding to the Bodrog River catchment area in Slovakia and the Tisza-valley between Záhony and Tokaj (confluence with the Bodrog River) has been selected as important due to (i) its significance in meeting the water demand of the region, (ii) contamination threat of the groundwater in the vicinity of state border between Slovakia and Hungary. Some part of the water aquifer system is in Ukraine.* ***General description*** *The aquifer is the alluvial deposit of the Bodrog River and its tributaries. The Tisza divides the lowland area in Hungary into Bodrogköz (northern part) and Rétköz (Southern part). Holocene silty-clayey layers cover the surface with peaty areas. The Quaternary aquifer is around 60 m thick in the Slovakian side and its thickness gradually increases in Hungary towards the South (50-200 m). The fluvial sediments (from sandy gravels in the North to sands is the South with intercalated silt and clay lenses) can be characterized by 5 – 30 m/d hydraulic conductivity.* *In the Slovakian part only the Quaternary aquifer system is part of the transboundary water body-complex while in Hungary the Upper part of the Pannonian formation is also attached (depth is app. 500 m, corresponding to water temperature less than 30 ^oC). The horizontal extension of the water body in the Slovak side is 1466 km^2, while in Hungary the two water bodies cover an area of 1300 km^2.* *The main recharge area is in the Slovakian territory. The rain waters infiltrate at the marginal mountains and penetrate into permeable deep aquifers. In the upstream part of the catchment area surface waters also contribute to the recharge. In the Slovakian side the water bodies are mainly unconfined or in some places partly confined. In Hungary both water bodies are in discharge position and the main aquifers can be considered as confined. Here the groundwater level lies close to (between 2 and 4 m below) the surface. Where it is around 2 m below the surface, the groundwater can considerably contribute to the transpiration need of the vegetation, which are adapted to that condition, and*

MS_Code	SK1001500P / HU_P2.4.2, HU_P2.5.2
	consequently they are very sensitive to the status of the groundwater. The surplus of evapotranspiration and the artificial drainage system (canals) collect the upward groundwater flow. From South, the sandy hills of Nyírség contribute to the discharged groundwater as well, but the boundary of the waters of different origin is not exactly known (that is why both discharge areas in Hungary have been attached to the transboundary aquifer). The general direction of the groundwater flow is N-S (NE-SW) to the North of the Tisza River and SE-NW in the Rétköz and uncertain below the Tisza. *The regional hydro-geochemical picture follows the flow system. Close to the river bed sections recharging groundwater, the water quality is almost the same as in surface streams. Generally low TDS, Ca-Mg-HCO_3 type waters occur in the recharge areas, Na-HCO_3 waters dominate in the middle and western part of Rétköz, and mixture of these two types in the western part of Bodrogköz region. At the centre of the Bodrogköz, elevated Cl-content indicates strong upward migration from the deeper zones.* *The major water quality problem of natural origin in the Bodrogköz Quaternary aquifer complex is the high iron and manganese content (reducing conditions). In the Rétköz elevated (10 - 30 μ/l) arsenic-content occurs.* *The estimated amount of available groundwater resources is almost 50 Mm^3/year in the Slovakian part, out of that 10 – 15 Mm^3/year should be maintained as lateral flow towards the Hungarian part. It is to be mentioned, that the southern part of the Hungarian discharge area receives water from the southern recharge areas as well, but no local recharge can be considered available for abstraction in the Bodrogköz and Rétköz.* ***Major pressures and impacts*** *The groundwater is mainly used for drinking water supply, but partially for industrial and agricultural purposes (inc. irrigation) as well. The use ratio is quite low in Slovakia: only 10 %. The development is limited by occurrence of technologically inappropriate substances in water (Mn, Fe) and sometimes also by groundwater pollution from surface waters, industry, agriculture and transport infrastructure (Strážske, Hencovce, Michalovce, Čierna nad Tisou).* *In Hungary the available groundwater resources of the two water bodies are quite different. In the northern part, which is in close relation to the Slovakian part, the water demand of the groundwater dependent aquatic and terrestrial ecosystems can be estimated at 5 - 8 Mm^3/d, thus the available groundwater resources is in the range of 5 - 7 Mm^3/year. The abstracted amount of groundwater is 3 Mm^3/year, so the ratio is around 50 %, but the majority is concentrated to Ronyva/Roňava river valley. In the southern part, the lateral flow from the recharge zone of Nyírség (app. 30 Mm^3/year) provides sufficient water for the minimum water demand of ecosystems (8-12 Mm^3/year) and for 8 Mm^3/year of abstraction.* *The groundwater quality in the Slovakian part (mainly the alluvial sediments along Laborec) is strongly influenced by potentially risk diffuse (mainly agricultural activities) and point sources (chemical industry Chemko Strážske etc.). In Hungary 10 significant point sources of pollution have been registered. The shallow groundwater has usually high nitrate under the settlements, because of the inappropriate handling of manure and the totally or partially missing sewer systems. The agriculture contributes to the pollution as well, through use of chemicals. The estimated amunt of surplus Nitrogen is 15 kgN/ha/year originated from the use of 88 kgN/ha/year fertilizer and 13 kgN/year manure.* *The groundwater quality in Slovakia is monitored in 21 sampling sites, groundwater samples are taken from the first aquifer once a year (in the autumn). In agricultural area nitrogen substances and micro-pollutants have been found exceeding limit values. The Hungarian water quality monitoring is concentrating in the surrounding of waterworks. The quality of the Ronyva/Roňava aquifer close to the waterworks of Sátoraljaújhely shows increasing tendency of Nitrate pollution: the average concentration is around 30 mg/l, and in one production well the Nitrate-concentration exceeds the limit value of 50 mg/l. Information on pollution in arable lands is practically missing in this region.* *The high vulnerability of groundwater and the expected future development in water demand requires high level of protection in the Slovakian part of the region mainly oriented to measures focused on industrial pollution sources. In Hungary the protection zones of the waterworks (5 %) need special attention.*

MS_Code	SK1001500P / HU_P2.4.2, HU_P2.5.2
description of methodology for estimating the risk of failure to achieve the good status	*See Body 8*
GW body identified as being at risk of failing to meet the objectives under Art. 4	*Despite the local problem of the Ronyva/Roňava aquifer where the exploitation is 100 % and the demand would be higher than the available amount, the water bodies are not at risk from quantitative point of view. However this aquifer needs special attention.* *According to the Slovakian method of identification of delineated groundwater bodies at risk as a summary, the groundwater body in the Slovakian part is considered at risk from potentially risk diffuse, point sources and present chemical state point of view. Main contaminants are nitrates, manganese coupled with elevated TDS values.* *In Hungary the estimated danger related to the point sources of pollution does not show risk (the ratio is 0,006 against 0,1 of threshold value) The preliminary evaluation of the Nitrate-load from settlements and from agriculture does not show risky situation, especially because of the confined conditions and the regionally characteristic upward flow system.* *The Nitrate pollution of the Ronyva/Roňava aquifer represents potential danger for the half of the resources originated from Slovakia, but the actual extent of the problem compared to the whole groundwater body should be further assessed. Therefore the water body is classified in the category "possibly at risk".*
Lower objectives identified according to Art. 4 and Annex II 2.4 and 2.5	*No lower objective is needed.*
Gaps and uncertainties in the underlying data	*Although the pressure from the diffuse sources of pollution was assessed as not significant, more information is needed about their real impact; development of the actual monitoring is necessary.*

10: Slovensky kras / Aggtelek-hgs.

MS_Code	SK200480KF / HU_K2.2.1
descriptive text on the important transboundary groundwater body	***Delineation**: see Body 8* ***Reasons for selecting as important transboundary groundwater body*** *The Aggtelek Mountain and the Slovensky kras form a large common karstic aquifer system in the Eastern part of the counrtries. It is selected for presenting in the Danube-basin report as important transboundary water body: (i) National Park covers the majority of its surface, where the role of the groundwater is presented by springs and stalactite caves, (ii) significant drinking water resource in Slovakia, regionally important in Hungary (iii) vulnerable area requiring protection.* ***General description*** *The groundwater body is in a Mesozoic complex with morphologically visible karstic plateau and canyon-like valleys of water courses, separating different units. Hydrogeological units are very different according to the character of permeability, character of groundwater circulation, type of groundwater regime, and also in the resulting yield of groundwater springs. From hydro-geological point of view, the most important tectonic unit in the area is the Silicicum unit, mainly its Middle Triassic and Upper Triassic part. The most important aquifer here is the Middle and Upper Triassic limestone and dolomites with karst-fissure type of permeability. Similarly important hydrogeological units in the Hungarian side are Alsóhegy, Nagyoldal, Hasagistya and Galyaság, which contain the Aggtelek-Domica cave system. Tertiary basins act as a regional impermeable barrier for the groundwater accumulated in Triassic limestone.*

MS_Code	SK200480KF / HU_K2.2.1
	The transboundary karstic aquifer is divided into two water bodies by the state-border. The horizontal extensions are 598 km^2 and 471 km^2 respectively in Slovakia and in Hungary, thus the total size is 1069 km^2. *Groundwater circulation in these rocks is controlled by extreme heterogeneity of carbonate rocks, following the tectonic development. These tectonically pre-destinated drainage structures show the major influence on the directions of groundwater flow. Majority of groundwater is drained towards big karstic springs. Areas between such tectonic faults are less karstified and also less permeable. If not drained by cave systems or permeable tectonic faults, groundwater usually feeds the Quaternary coverage. Specific hydraulic feature of the karstified carbonate complex with preferred drainage structures is that no continuous groundwater table ca be defined within the rock mass. Groundwater in many cases only fills up karstic openings – conduits, sometimes enlarged into the cave systems, while segments between the preferred groundwater routes are unsaturated. On the other hand, groundwater level changes in these zones are sharp and show quick response to the meteorological situation. Typical amplitude of groundwater level change is from 5 to 15 m. In such levels above the erosion base perennial springs occur after an intensive rainfall events or sudden snowmelts. Hidden outflow to the deeper structures within and outside of the area the territory (generally of westward direction under the Tertiary sediments of the Rimavská kotlina Basin) is considered to be quite important from the water management point of view. Groundwater abstraction for various purposes is concentrated at the natural outflows of springs – relatively small portion is abstracted by pumping from boreholes and wells.* ***Major pressures and impacts*** *The estimated amount of available resources in Slovenský kras is 40,4 Mm^3/year, the actual use is 21 % of available resources, mainly for drinking water purposes.* *In the Hungarian side only the amount of karstic water is utilized, which flows out naturally from karstic springs in Jósvafő, Szögliget, Komjáti, Égerszög and Aggtelek. There are enough data about karst spring discharge. Observed discharge data are available for a period of nearly 30 years. Because of the National Park no important karstic water abstraction will be planned on the area.* *On the plateaux, forestry is predominant, with some agriculture, settlements and related economic activities are concentrated in the basins and river valleys. In both countries only a few point sources of pollution occur and the intensive agriculture is also insignificant.* *National Parks cover the majority of the area. In addition, in Hungary the total area of the groundwater body is considered as Nitrate-sensitive.* *The groundwater quality in the Slovakian side has been monitored in 16 sampling sites, groundwater samples are taken from the first aquifer once a year (in the autumn). Quality monitoring shows no deterioration of the water quality compared to drinking water standard.* *6 karst springs are monitored 4 times per year for quality sampling in Hungary, which do not show signs of pollution.*
description of methodology for estimating the risk of failure to achieve the good status	*See Body 8*
GW body identified as being at risk of failing to meet the objectives under Art. 4	*In respect to quantitative status, both parts of the transboundary aquifer is not at risk, even if the ecological criteria corresponding to minimal flow of springs are not yet precisely determined.* *According to the Slovakian method of identification of delineated groundwater bodies at risk, Slovakia classifies its part not at risk from qualitative point of view. In Hungary the protected area (National Park and Nitrate sensitive areas) cover the total territory, and the open karstic area belongs to the very vulnerable category, but the Hungarian methodology for risk assessment does not consider the vulnerable area automatically at risk.*

MS_Code	SK200480KF / HU_K2.2.1
Lower objectives identified according to Art. 4 and Annex II 2.4 and 2.5	*No lower objective should be determined, but the nature conservation areas would need special requirements*
Gaps and uncertainties in the underlying data	*The ecologically necessary spring rates for corresponding surface waters are not yet known, but the precautionary approach, i.e. the use of natural spring yield only, makes the critical situation easily manageable*

11: Komarnanska Vysoka Kryha / Dunántúli-khgs. északi r.

MS_Code	SK300010FK, SK300020FK / HU_K.1.3.1, HU_K.1.3.2, HU_K.1.5.1, HU_K.1.5.2
descriptive text on the important transboundary groundwater body	***Delineation**: see Body 8* ***Reasons for selecting as important transboundary groundwater body*** *The Middle and Upper-Triassic karstic dolomite and limestone formation of the northern part of the Transdanubian Mountain (Hungary) and the Komarnanská Výsoká Kryha (Slovakia) belong to one of the largest karstic aquifer systems in Central Europe. It provides good quality drinking water for the population of the region in Hungary, contributes to the characteristic landscape by supplying springs and the deeper part of the aquifer system is very important thermal water resources in both countries.* ***General description*** *The karstic formation of the northern part of the Transdanubian Mountains is composed mainly of Upper-Triassic dolomite and limestone. The considerable matrix porosity of the dolomite is due to the dense fissure-system, while in the limestone large fractures are characteristic along the faults. The elevated open karstic zones are separated by sunken basins, where the thickness of the covering layer is several hundred meter. Above the thermal part it exceeds 500 m of thickness (in some places it reaches even 2500 m) consisting of different types of sediments: sand, clay, marl, sandstone, Eocene karstic formation with brown coal.* *The Slovakian part (the Komarno block) extends between Komarno and Sturovo. It is fringed by the Danube River in the South and by the E-W Hurbanovo fault in the North. The southern limit along the Danube is tectonic as well and therefore the Komarno block is a sunken tract of the northern slope of the Gerecse and Pilis Mountains. The Komarno block consists largely of Triassic dolomites and limestones up to 1 000 m in thickness. The surface of the pre-Tertiary substratum plunges towards the north from a depth of approximately 100 m near the River Danube to as much as 3 000 m near the Hurbanovo fault.* *The karstic aquifer is divided into six water bodies. In Hungary, where the recharge area appears, two water bodies bearing cold waters (HU_K.1.3.1 and HU_K1.5.1) have been delineated according to the flow system. The thermal water bodies (in Hungary waters with temperature more than 30 ^{o}C is considered as thermal, while in Slovakia the limit is 25 ^{o}C: HU_K.1.3.2, HU_K1.5.2, SK_300010FK and SK_300020FK) are in close hydraulic connection with the cold ones. To be noted, that the missing continuation of the cold water bodies in the Slovakian part is mainly due to the different consideration of the limit of temperature. Taking into account hydro-geothermal aspects, the deep Slovakian karstic aquifer is divided into the Komarno high block (SK 300010FK) and the Komarno marginal block (SK300020FK). The total area of the transboundary water body-complex is 3601 km^2 (563 km2 in Slovakia and 3138 km^2 in Hungary).* *The Danube River is the regional erosion base of the water bodies. The water level fluctuation is in strong relation with the water level changes in the river. The water bodies are hydraulically connected. It is valid at the border of the countries as well, i.e. under the Danube and the Ipoly/Ipel Rivers, making the abstractions of water in both countries highly interrelated.* *The recharge area is in the Hungarian side and the total recharge is estimated at 60 Mm^3/y. Without abstraction this amount of water is discharged by the springs and by the upward*

MS_Code	SK300010FK, SK300020FK / HU_K.1.3.1, HU_K.1.3.2, HU_K.1.5.1, HU_K.1.5.2
	flow towards the covering layer, and some part is infiltrating to the deeper, thermal part. *The temperature of the water abstracted (captured) from the Hungarian thermal water bodies does not exceed 50 °C. Heat-flow densities suggest that the Komarno high block can be characterised by a fairly low (thermal spring at Sturovo and Patince are 39 and 26 °C warm) and the marginal block by a medium geothermal activity (40 – 68 °C). Heat flow given in mW/m^2 is 50- 60 in Komárno high block and 60 – 70 mW/m^2 in Komárno marginal block, both considered as low values.* *Coefficient of transmissivity in the high block varies from 13 to 100 m^2/d, while in the marginal block between 4 to 20 m^2/d. Prognostic recoverable amount of thermal water in the high block is estimated at 12,000 m^3/d water of 20 to 40 °C warm. In the marginal block the abstracted thermal water should be re-injected after use.* ***Major pressures and impacts*** *In Hungary the actual abstractions are apr. 30 M m^3/y from the cold part and 2 M m^3/y from the thermal part. In Slovakia the thermal water abstraction is 0,6 M m^3/y mainly in area Komárno-Patince-Štúrovo. The cold karstic water is used for drinking water, the thermal water for balneology (in Hungary and in Slovakia) and for energy production (in Slovakia). Disposal of used geothermal water is solved in Slovakia by discharge into surface water (River Danube and Váh) after dilution with groundwater on acceptable qualitative parameters.* *Due to the mining activities in the 20th century, the actual water levels - especially in the cold water bodies in the Hungarian side - are significantly lower than the long-term natural averages and as a consequence all cold and lukewarm karstic springs dried out. In the Slovak side the regime of geothermal water (decreasing discharges of wells) was also affected by the extensive pumping of karstic water from coal mines in Tatabánya and Dorog (Hungary). After the mining was stopped (in 1993), the water levels have been showing increasing trend and the gradual reappearance of the springs is forecasted in the coming 5-15 years.* *The abandoned cuts and fields of mine submerged by the rising karstic water represent a potential pollution source. Water quality monitoring has been installed, but data are not sufficient for estimating future impacts.* *In extremely vulnerable open karstic area a few settlements should be considered as potential source of pollution. Relatively a high number of significant pollution exists in the area (40). The majority is lying above the not vulnerable covered part. The average amount of Nitrogen fertilizer is 86 kgN/ha/year, the use of manure is insignificant (3 kgN/ha/year). The surplus Nitrogen from agriculture is 17 kgN/ha/year, but in the majority of the area the thick covering layers provide natural protection. (Localities in real danger should be assessed at smaller scale, focusing on open karstic zones).*
description of methodology for estimating the risk of failure to achieve the good status	*See Body 8*
GW body identified as being at risk of failing to meet the objectives under Art. 4	*In Hungary the use ratio can be 70 % - 130 % of the available groundwater resource depending on the consideration of the following water demands: (i) spring rates to assure the ecologically necessary low flow in the creeks of the region and used and to provide water for balneological and recreational purpose as well, (ii) the natural upward flow from the karstic aquifers contributing to the groundwater levels in the lowland close to the Danube, providing suitable conditions for terrestrial ecosystems of high demand of transpiration. The total amount can range between 15 and 35 Mm^3/year (mostly depending on the requested rate of the karstic springs around Tata town. So, the uncertainty is very high, especially considering that the actual state still shows the impact of the former lowering of water levels related to the mining.* *In Hungary the authorisation of thermal water abstraction is very limited, the control is strict, therefore the abstraction is less than the available amount, but the increasing demand still represents a continuous pressure.*

MS_Code	SK300010FK, SK300020FK / HU_K.1.3.1, HU_K.1.3.2, HU_K.1.5.1, HU_K.1.5.2
	Information about long-term geothermal water regime (pressure), abstraction and quality aspects are not sufficient in Slovak side. *Considering the actual pressures, status and the uncertainty together, the risk assessment can not be done in reliable way neither for the qualitative nor the quantitative status. About missing information see the corresponding chapter below.*
Lower objectives identified according to Art. 4 and Annex II 2.4 and 2.5	*At the moment no lower objective is foreseen. In the Hungarian side the overexploitation of groundwater by mining caused problems, which could be handled by lower objectives, but considering the stop of the mining activity and the recovering water levels, the achievement of the good quantitative status is not at risk. Further monitoring is required for confirmation of real achievement of good quantitative and qualitative status, as the results were not proven yet.*
Gaps and uncertainties in the underlying data	*In Hungary the environmental requirements (minimum yield) towards the reappearing karstic spring has to be determined, which deeply influences the available groundwater resources. The recovery of the water levels is also to be analysed.* *The real impact on the water quality of the abandoned mine should be investigated by adequate monitoring.* *This resource serves to recharge the abstractions from the thermal aquifers too, whose mechanism is not very well known. The flow system (communication and recharge conditions) between the cold and the thermal part and inside the thermal blocs is to be studied in order to estimate the available thermal resources in a more appropriate way. In Hungary the monitoring data are insufficient, while in Slovakia there is no national geothermal monitoring network.*

ANNEX 13 Important Water-related Protected Areas for Species and Habitats of Basin-wide Importance

The water-related protected areas for species and habitat protection shown here represent provisional national designations. The final designation depends on the EU approval process.

Country Code*	River basin	Name of protected area	Description	Protection type	Area (ha)	Legal basis
GERMANY						
DE15	Donau	Donau zwischen Sigmaringen und Tuttlingen	River gorge and gallery forests of the Upper Danube	FFH area	4,896	Fauna-Flora-Habitat-Richtlinie (92/43/EWG)
DE16	Donau	Donauauen zwischen Ingolstadt und Weltenburg	Danube gorge	FFH area	2,715	Fauna-Flora-Habitat-Richtlinie (92/43/EWG)
DE17	Donau	Donauauen zwischen Straubing und Vilshofen		FFH area with overlapping bird area	4,548	Fauna-Flora-Habitat-Richtlinie (92/43/EWG)
DE18	Isar	Untere Isar zwischen Landau und Plattling		FFH area incl. bird area	1,203	Fauna-Flora-Habitat-Richtlinie (92/43/EWG)
	Isar	Isarmündung	intact floodplain forest at the confluence of Isar and Danube	FFH area with overlapping bird area	1,796	Fauna-Flora-Habitat-Richtlinie (92/43/EWG)
	Isar	Untere Isar oberhalb Mündung	Isar above the confluence with the Danube	FFH area including bird area	964	Fauna-Flora-Habitat-Richtlinie (92/43/EWG)
DE19	Isar	Starnberger See	important lake of alpine foothills	FFH area partly overlapping with bird area	5,670	Vogelschutzrichtlinie (79/403/EWG)
DE20	Inn	Chiemseegebiet	alpine foothill lake with typical lowland, mires and reed belt	bird area with overlapping partly FFH area	13,052	Vogelschutzrichtlinie (79/403/EWG)
DE21	Salzach	Nationalpark Berchtesgaden	northern limestone Alps (headwaters and lake Königssee)	FFH area and bird area	21,336	Fauna-Flora-Habitat-Richtlinie (92/43/EWG)
AUSTRIA						
AT1	Salzach/Drau/Isel/Möll	Nationalpark Hohe Tauern without Bundesland Tirol	important headwaters for many alpine rivers	National Park	119,000	Nature protection Law (Länder/Bund)
AT2T	Raab	Nationalpark, Biosphärenreservat und Ramsar-Gebiet Neusiedler See - Seewinkel	shallow steppe lake; internationally important bird site	National Park	22,200	Nature protection Law (Länder/Bund)
AT3T	Thaya	Nationalpark Thayatal	transboundary gorge valley with meanders	National Park	1,330	Nature protection Law (Länder/Bund)
AT4T	Donau	Nationalpark Donauauen im Ramsar-Gebiet Donau-March-Auen	trilateral Ramsar site with floodplain forests and meadows	National Park	9,300	Nature protection Law (Länder/Bund)
	Donau	Ramsar-Gebiet Untere Lobau im Nationalpark Donauauen	last intact floodplains of the Upper Danube	Biosphere Reserve	10,000	Nature protection Law (Länder/Bund)
	Donau/March	Ramsar-Gebiet Donau- Marchauen	(see above)	Ramsar	38,500	Nature protection Law (Länder/Bund)
AT5	Lafnitz/Raab	Ramsar-Gebiet Lafnitztal	meandering prealpine river landscape with large meadows	Ramsar	2,180	Nature protection Law (Länder/Bund)

Country Code*	River basin	Name of protected area	Description	Protection type	Area (ha)	Legal basis
CZECH REPUBLIC						
CZ3T	Morava	Národní park Podyjí	transboundary gorge valley with meanders	National Park	6,300	Nature protection Law no. 114/1992 designed by CR government decree no. 164/1999
CZ13	Morava	Chránená krajinná oblast Litovelské Pomoraví	Extended floodplains of the middle Morava	Protected Landscape Area	9,600	Nature protection Law no. 114/1992 CR Ministry of Environment Decree t no. 464/1990
CZ14	Morava	Chránená krajinná oblast Pálava	Dyje floodplain and Limestone rocks with steppe habitats	Protected Landscape Area	8,300	Nature protection Law no. 114/1992 CR Ministry of Culture act no. 5790/1976
SLOVAK REPUBLIC						
SK4T	Morava	Niva Moravy	Extended floodplain meadows of the lower Morava	prel. Natura 2000	5,380	
SK45T	Vah	Horná Orava	peatlands of the Western Carpathians	Ramsar Site, Protected Landscape Area	9,264	
SK26T	Slana, Hornad	Slovenský kras, plus Domica	transboundary karst caves and subterranean wetland Domica	Natural World Heritage Site, Biosphere Reserve, National Park (including Ramsar Site)	36,166	
SK46T	Dunaj	Šúr	largest preserved, primeval alder swamp forest in Central Europe	Ramsar Site, National Nature Reserve	1,137	
SK47T	Bodrog	Latorica	lowland floodplain meadows, forests and oxbow system	Ramsar Site, Potected Landscape Area	4,400	
SK48	Vah, Poprad a Dunajec	Vysoké Tatry	alpine headwaters of the Tatra mountains, alpine lakes	Biosphere Reserve, National Park	74,100	
SK49	Hron	Slovensky raj	gorges valleys and caves of the central Slovak mountains	National Park	32,774	
SK50	Dunaj	Dunajské luhy	The largest Danube inland delta in Central Europe with artificial hydrological system, floodplain forests, oxbows	Ramsar, protected landscape area	14,488	
HUNGARY						
HU25	Sio	Balaton	largest (steppe) lake of the DRB	Ramsar	59,800	
	Sio	Kis-Balaton	reed bed and succession area of the western Balaton	National Park, Ramsar	14,745	
HU26T	Sajo	Baradla	transboundary karst cave system	National Park, Ramsar	2,075	
HU22T	Duna	Gemenc (within Duna-Drava national park)	large Danube hardwood floodplain forests and old meander arms	National Park, Ramsar	16,873	
	Duna	Béda-Karapancsa (within Duna-Drava NP)	large Danube hardwood floodplain forests and old meander arms	National Park, Ramsar	1,150	
	Drava	Szaporcai Ó-Dráva-meder	lower Drava oxbow lake system within the Duna-Drava NP	National Park, Ramsar	257	
HU27	Tisza	Hortobágy-Halastó	puszta grasslands and bird site of inner Pannonian plain	National Park, Ramsar	2,072	
HU2T	Rabca	Ferto-tó	transboundary steppe lake NP and Hansag reed beds	National Park, Ramsar	8,432	
HU28	Dunav	Izsáki Kolon-tó	remaining former floodplain lake of the Danube	National Park, Ramsar	2,962	
HU29	Bodrog	Bodrogzug	mouth of Bodrog river into Tisza floodplains	Ramsar, landscape protection area	3,782	

Country Code*	River basin	Name of protected area	Description	Protection type	Area (ha)	Legal basis
SLOVENIA						
SI51	Sava	Triglavski narodni park & Zelenci	headwaters of the Sava Dolinka and Sava Bohinjka, raised bogs, Triglav mountain lakes and Bohinj lake	National Park	84,000	
SI52	Ljubljanica	Notranjski trikotnik (including Cerkniško jezero, Planinsko polje, Pivška jezera, Planinska jama, Križna jama, Rakov Škocjan)	karst catchment of the Ljubljanica River a tributary to the Sava River, endemic species	National Park		
SI53	Sava	Krakovski gozd	floodplain forest, wet meadows, endangered species	partly, Nature Reserve		
SI54	Mura	Mura z mrtvicami	ox-bows, riparian forest, floodplain wetlands	planned RP		
CROATIA						
HR22T	Dunav	Kopacki rit	mouth of Drava into Danube, most important softwood floodplain in DRB	Nature Park	22,894	Low of Nature protection
HR23	Sava	Lonjsko polje	largest floodplain with meadows and woods in the Sava basin	Nature Park	50,600	Low of nature protection
HR24	Korana	Plitvicka jezera	unique karst wetland with limestone-sinter terraces	National Park	29,482	Low of Nature Protection
BOSNIA I HERZEGOVINA						
BA6	Vrbas	Ornitološki rezervat Bardaca	Lower Sava floodplains	Nature Reserve	700	Law on Nature Protection, 1963
SERBIA AND MONTENEGRO						
CS38	Tara/Drina	Tara	Balkan mountains with gorge valley	National Park	19,175	The Law on National Parks, RS Off. Gazette No. 39/93
CS22T	Danube	Gornje podunavlje	important floodplains of the middle Danube	Nature Reserve	19,648	Decree on Protection of Gornje Podunavlje Special Nature Reserve (Off. Gazette RS, 45/01)
CS39	Tisa	Slano kopovo	Salt water pool surrounded with the seasonally wet halophilous meadows	Nature Reserve	976	Decree on Protection of Slano kopovo Special Nature Reserve
CS40	Dunav	Koviljsko-Petrovaradinski rit	important floodplains of the middle Danube	Nature Reserve	4,841	Decree on Protection of Koviljsko-Petrovaradinski rit Special Nature Reserve (Off. Gazette RS, 1998)
CS41	Sava	Obedska bara	old Sava meander with floodplain forests and reed beds	Ramsar	9,820	
CS42	Sava	Zasavica	groundwater-fed floodplain habitats next to Sava	Nature Reserve	1,150	
CS43	Tisa	Ludasko Jezero	Shallow lowland lake of aeolian type	Ramsar	328	Decree on Protection of Ludasko jezero Special Nature Reserve (Off. Gazette RS, 1994)
CS44	Tisa	Stari Begey-Carska Bara	Floodplain between Tisa and Begej	Ramsar	1,767	Decree on Protection of Stari Begej - Carska bara Special Nature Reserve (Off. Gazette RS, 1994)

Country Code*	River basin	Name of protected area	Description	Protection type	Area (ha)	Legal basis
BULGARIA						
BG7	Iskar river	Rila National park	eastern Balkan Karst with headwaters	National Park	81,046	Protected Areas Act from 11.11.1998 (PAA - 1998) Designated with a decree N 114 of the Bulgarian Ministry of Environment and Water
BG8	Jantra river	Central Balkan National Park	eastern Balkan Karst with headwaters	National Park	71,669	(PAA - 1998), Designated with a decree N 843 of the Bulgarian Min. of Environment and Water
BG9	Danube river	Persina	Intact example of the Lower Danube floodplains	Nature Park	21,762	(PAA - 1998),Designated with a decree N RD 684 of the Bulgarian Min. of Environment and Water
	Danube river	Belene island complex	Example of Lower Danube floodplain islands	Ramsar	6,898	
BG10	Beli Lom, Cherni Lom	Rusenski Lom	special river valley (Danube tributary)	Nature Park	3,259	(PAA - 1998), Designated with a decree N 567of the Bulgarian Min. of Environment and Water
BG11	Danube river	Kalimok Brashlen	Intact example of the Lower Danube floodplains	Protected Site	5,952	(PAA - 1998), Designated with a decree, No RD 451of the Bulgarian Ministry of Environment and Water
BG12	Danube river	Srebarna lake	Important example of Lower Danube floodplain lakes	Maintained reserve	1,357	(PAA - 1998), Designated with a decree No 11931of the Bulgarian Ministry of Environment and Water
ROMANIA						
RO32	Crisul Negru	Parcul Natural Apuseni	Carpathian mountains, headwaters	Natural Park	76,064	Order of Minister
RO33	Dunarea	Parcul Natural Balta Mica a Brailei	extended floodplain island on the lower Danube	Natural Park - Ramsar Site	20,455	Decision of the County Council
RO34	Jiu	Parcul National Retezat	Carpathian mountains, headwaters	National Park	38,138	Journal of the Ministries`s Council
RO35	Somesul Mare	Parcul National Muntii Rodnei	Carpathian mountains, headwaters	National Park	47,227	Order of Minister
RO36	Dunarea	Parcul National Domogled - Valea Cernei	Carpathian mountains, headwaters	National Park	61,211	Decision of the County Council
RO37T	Dunarea	Rezervatia Biosferei Delta Dunarii	Danube delta	Biosphere Reserve, World Heritage and Ramsar Site	576,216	Decree
MOLDOVA						
MD30	Prut	Lacurile Prutului Inferior	riverine wetlands of the pontic ecoregion	Ramsar	19,153	Law on Fund of Natural Areas Protected by State
MD31	Prut	Rezervatia stiintifica "Padurea Domneasca"	Scientific reservation "Padurea Domneasca"	Nature Reserve	6,032	Law on Fund of Natural Areas Protected by State

Country Code*	River basin	Name of protected area	Description	Protection type	Area (ha)	Legal basis
UKRAINE						
UA55	Dunav	Kugurlui lake	unique liman lakes of the lower Danube	Ramsar	6,500	
UA37T	Dunav	Kyliiske mouth (Danube delta)	morphologically most active part of the Danube delta	Biosphere reserve, Ramsar	32,800	

*** T = transboundary cooperation**