

**STATUTE
on the monitoring of natural environment
on the Sap-Budapest Danube section**

A N N E X 1

Monitoring sites, objects and monitored parameters
for the Slovak republic

August 2008

Surface Water Levels and Discharges Observation Sites

No.	Object No.	Object Name	Watercourse	Location	River km	C o o r d i n a t e s	„0“ point (m a.s.l.)	Data types
					X JTSK	Y JTSK		

Sap - Komárno Section

Objects included in the Joint Monitoring according to the Agreement 1995

1	1252	5145	Danube	Medved'ov	1806.3	1323937.00	536280.88	107.38	H, Q - daily average
2	1600	6850	Danube	Komárno – bridge	1767.8	1331151.00	501957.41	103.40	H, Q - daily average

Objects beyond the Joint Monitoring according to the Agreement 1995

3	1504	5144	Danube	Sap	1810.0	1320837.00	539283.63	108.09	H - daily average
4	1505	6810	Danube	Klížská Némá	1792.4	1330001.00	525654.69	104.65	H - daily average
5	1506	6830	Danube	Zlatná na Ostrove	1779.1	1330211.13	512784.59	103.92	H - daily average
6	1655	5280	Little Danube	Trstice	22.7	1302507.97	524165.99	107.88	H, Q - daily average
7	2549	6775	Váh	Kolárovo	24.5	1312777.89	509175.92	105.91	H, Q - daily average

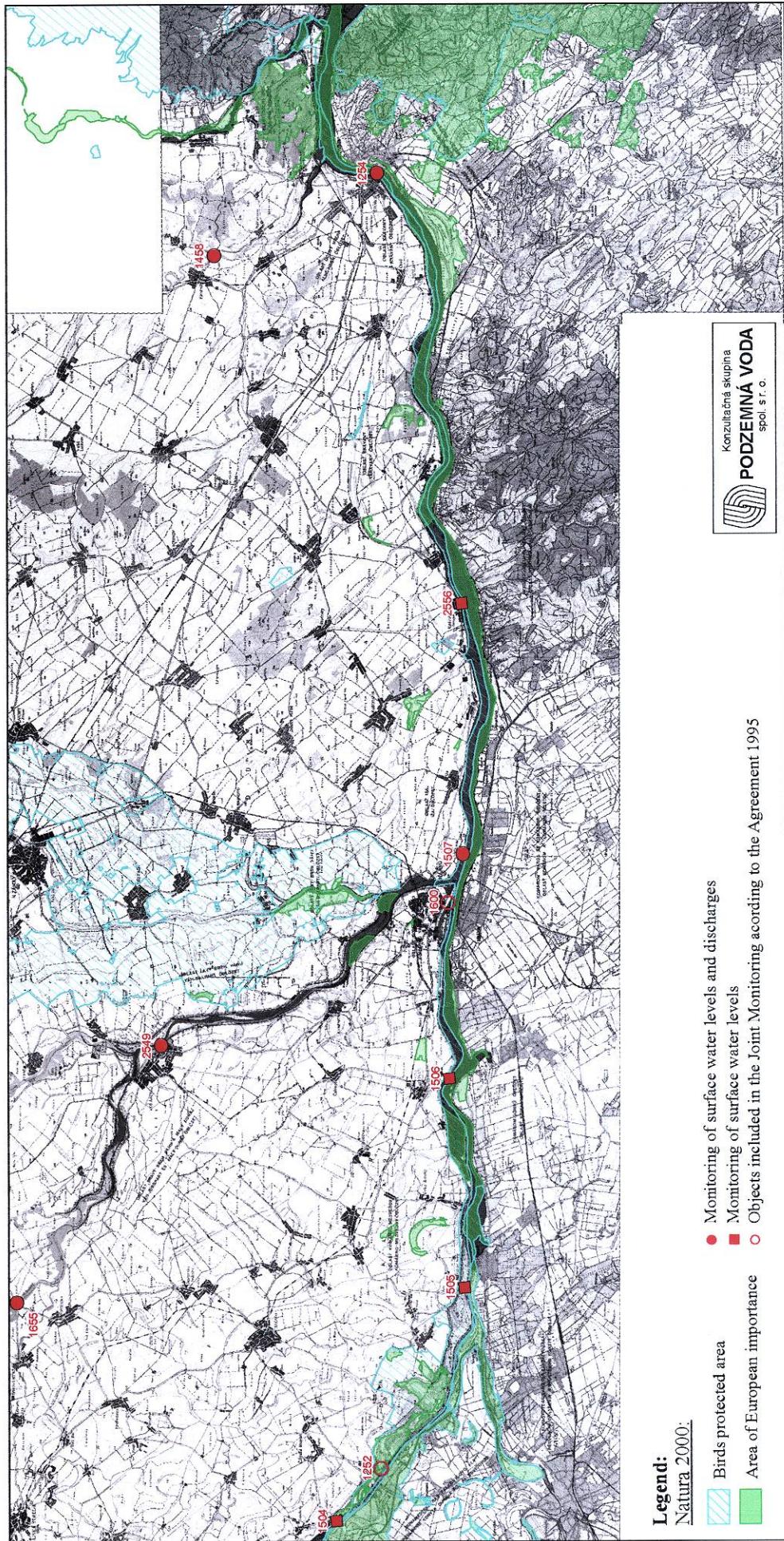
Komárno - Chlaba Section

8	1507	6860	Danube	Iža	1764.0	1332311.00	499078.59	103.56	H, Q - daily average
9	2556	6870	Danube	Radvaň nad Dunajom	1748.3	1333575.00	483752.81	102.88	H - daily average
10	1254	6880	Danube	Štúrovo	1718.6	1330820.00	456910.19	100.94	H, Q - daily average
11	1458	7335	Hron	Kamenín	10.9	1320388.00	461060.60	108.30	H, Q - daily average



Monitoring of natural environment on the Sap-Budapest Danube section

Monitoring of surface water levels and discharges



Surface Water Quality Observation Sites

No.	Object No.	Object Name	Watercourse	Location	Coordinates	Observed parameters
				X JTISK	Y JTISK	PCHP HM PP

Sap - Komárno Section

Objects included in the Joint Monitoring according to the Agreement 1995

1	3530	8018	Danube	Sap – Outlet Canal	1319862.00	539866.00
2	112	110890	Danube	Medved'ov	1323586.91	537116.10
3	1205	111090	Danube	Komárno – bridge	1331448.01	502503.27

Komárno - Chľaba Section

4	1208	111390	Danube	Szob	1329500.00	446000.00
5	1212	111790	Váh	Komárno	1330364.00	500836.00
6	1218		Váh	Kolárovo	1312800.00	509100.00
7	1213	111890	Hron	Kamenica nad Hronom	1326800.00	457100.00
8	1211	111690	Ipeľ	Salka	1320500.00	453300.00

Legend:

PCHP – Physical-Chemical Parameters
 HM – Heavy metals (filtered)
 PP – Phytoplankton

- frequency: 12 times per year
 - frequency: 12 times per year
 - frequency: 6 times per year

At selected observation sites Macrozoobenthos, Phytobenthos, Sediment quality and Fish population observations

Physical - Chemical Parameters

Water Temperature – T (°C)	
pH (-)	
Electric Conductivity at 25°C – EC25 (mSm ⁻¹)	
Dissolved Oxygen – O ₂ (mg l ⁻¹)	
Oxygen Saturation – O ₂ (%)	
Ammonium ion – NH ₄ ⁺ (mg l ⁻¹)	
Nitrates – NO ₃ ²⁻ (mg l ⁻¹)	
Nitrites – NO ₂ ⁻ (mg l ⁻¹)	
Phosphates – PO ₄ ³⁻ (mg l ⁻¹)	
Total Nitrogen - N _{total} (mg l ⁻¹)	
Total Phosphorus – P _{total} (mg l ⁻¹)	
Biological Oxygen Demand – BOD ₅ (mg l ⁻¹)	
Chemical Oxygen Demand – COD _{Mn} (mg l ⁻¹)	
Chlorophyl-a (mg l ⁻¹)	
Total Organic Carbon – TOC (mg l ⁻¹)	
Extractables UV (mg l ⁻¹)	
Dissolved Solids dried at 105°C (mg l ⁻¹)	
Saprobic Index (-)	
Suspended solids (mg l ⁻¹)	

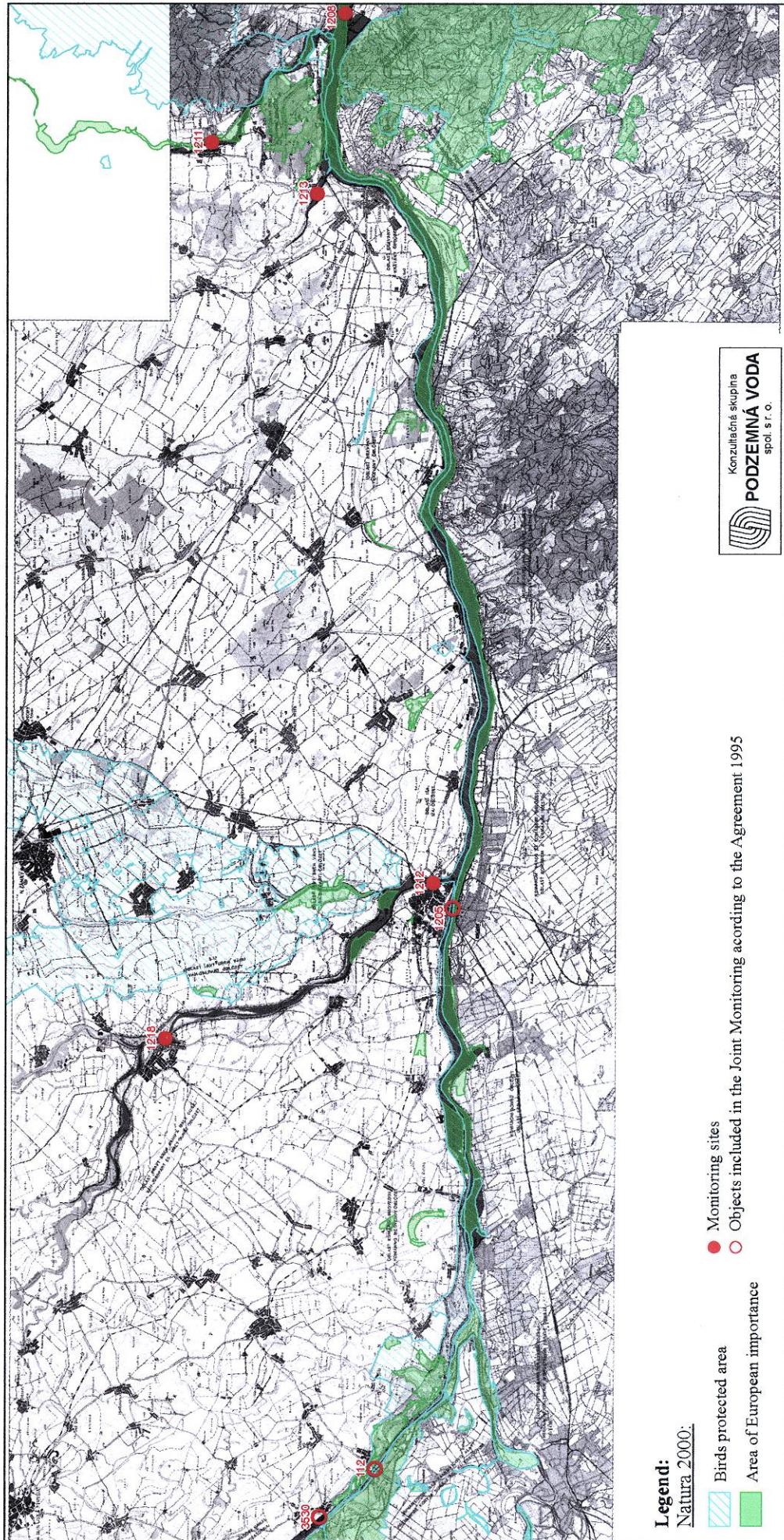
At selected observation sites

Sodium – Na ⁺ (mg l ⁻¹)	
Potassium – K ⁺ (mg l ⁻¹)	
Calcium – Ca ²⁺ (mg l ⁻¹)	
Magnesium – Mg ²⁺ (mg l ⁻¹)	
Iron – Fe (mg l ⁻¹)	
Manganese – Mn (mg l ⁻¹)	
Alcalinity – KNK _{4,5} (mmol l ⁻¹)	
Hydrogencarbonates – HCO ₃ ⁻ (mg l ⁻¹), calculated from Alcalinity	
Chlorides – Cl ⁻ (mg l ⁻¹)	
Sulphates – SO ₄ ²⁻ (mg l ⁻¹)	



Monitoring of natural environment on the Sap-Budapest Danube section

Monitoring of surface water quality



Legend:
Natura 2000:

- Birds protected area
- Area of European importance



Groundwater Level Observation Objects

No.	Object No.	Object Name	Location	Coordinates			Surface (m a.s.l.)	Data type
				X JTSK	Y JTSK	Z (m a.s.l.)		
Sap - Komárno Section								
1	1912	605	Komárno - Nová Stráž	1329470.86	507285.91	112.33	111.19	daily average
2	1913	606	Komárno - Hadovce	1325140.89	505445.91	109.45	108.68	daily average
3	1915	609	Zlatná na Ostrove	1329447.33	513236.63	111.69	110.85	daily average
4	1916	610	Okoličná na Ostrove - Štúrová	1321115.36	514671.25	109.43	108.63	daily average
5	4002	2611	Kolárovo	1319581.61	511485.27	109.65	108.73	daily average
6	1922	616	Bodza - Luky	1314365.98	517926.67	110.46	109.63	daily average
7	1924	618	Zemianska Olča	1322494.36	519551.77	110.42	109.30	once a week
8	1925	619	Tôň	1323229.65	522343.93	111.86	110.78	once a week
9	1927	621	Sokolce	1318032.28	523329.05	114.05	112.92	daily average
10	1928	622	Okoč	1314201.67	524356.04	113.21	111.97	daily average
11	1929	623	Okoč - Gólyás	1312896.62	521550.31	110.85	109.70	daily average
12	4435	2628	Kolárovo	1310386.61	512896.59	111.08	110.24	daily average
13	4428	2637	Sokolce - Madéret	1315744.13	519599.56	109.63	108.90	daily average
14	5096	2638	Kolárovo - Častá	1311983.90	515929.66	109.95	109.12	daily average
15	4003	2642	Okoč - Aszód	1309918.99	519147.85	110.41	109.58	daily average
16	1948	644	Veľký Meder	1316877.89	528085.85	113.35	112.15	daily average
17	1949	645	Medvedov	1323377.38	535916.05	114.33	111.88	daily average
18	1950	646	Veľké Kosihy	1329128.13	520107.86	111.53	110.87	daily average
19	4004	2647	Kližská Némá	1328699.35	526767.62	112.02	111.17	once a week
20	1952	648	Trávnik	1326043.94	525608.23	111.53	110.52	daily average
21	1954	650	Číčov	1327755.36	529726.72	112.38	111.38	daily average
22	4429	2652	Číčov - Kec	1323983.77	528212.88	110.44	109.79	daily average
23	1957	653	Ciližská Radyaň	1318262.99	533812.09	111.65	111.16	daily average
24	1958	654	Sap	1320150.39	539453.07	114.44	113.26	daily average
25	2387	7384	Komárno - Nová Stráž	1327135.70	507630.20	109.80	108.93	daily average
26	2712	B-18	Klúčovec - Sporná sihot	1324486.49	535286.52	113.88	112.63	daily average



Objects beyond the Joint Monitoring according to the Agreement 1995

27	262	7365	Sap	1321483.10	538279.55	113.24	112.66	once a week
28	534	P-21	Komárno - Alžbetin ostrov	1330883.21	503739.95	110.30	109.52	daily average
29	1918	612	Veľký Léľ	1328191.78	517016.05	112.93	112.10	daily average
30	1935	630	Kolárovo	1311101.19	511553.94	110.81	109.76	daily average
31	1955	651	Klúčovec	1323275.65	532032.41	112.00	111.58	daily average
32	2380	7377	Kolárovo - Čergov	1316133.41	508668.08	109.68	108.84	daily average
33	2385	7382	Komárno - Nová stráž	1329043.00	510134.70	110.88	110.30	once a week
34	2744	MP-12	Čiližská Radyň	1317567.70	534573.28	111.88	111.15	once in 2 week
35	2746	MP-14	Trávnik	1325781.80	525541.60	111.16	110.34	once in 2 week
36	2748	MP-16	Zlatná na Ostrove	1326593.11	512413.48	110.04	109.33	once in 2 week
37	2750	MP-18	Komárno	1328381.37	504632.78	109.51	108.74	once in 2 week
38	4001	2604	Komárno	1328876.74	504270.34	110.91	109.97	daily average
39	4018	2607	Kameničná	1323256.94	508091.61	111.54	110.70	daily average
40	4213	PSR-3	Čičov	1326529.42	531379.22	112.38	110.75	daily average
41	4304	641	Kližská Nemá	1329399.38	523749.70	112.36	111.40	daily average
42	5505	B-27	Veľké Kosihy - Trstiny	1327144.03	521943.70			daily average
43	5506	B-26	Veľký Léľ - Veľkolelský ostrov	1330806.13	515910.21			once in 2 week
44	5509	L-27	Čičov	1328383.59	531027.13			once in 2 week
45	5510	L-28	Kolárovo - Čergov	1317320.41	509278.86			once in 2 week

Komárno - Chľaba Section

46	1870	228	Komoča	1308892.64	506886.60	111.01	110.19	once a week
47	4524	229	Kolárovo - Počierok	1311131.33	508304.50	111.15	110.40	once a week
48	1882	241	Kava - Landor	1325549.44	503226.29	111.29	110.37	once a week
49	1883	242	Vrbová nad Váhom - Hliník	1322053.89	503614.25	110.95	109.85	once a week
50	4522	2244	Vrbová nad Váhom - Veľký Kindeš	1320130.53	505158.46	110.17	109.37	once a week
51	1885	245	Martovce	1319919.00	502401.00	109.18	108.35	once a week
52	1886	246	Martovce	1319249.78	501000.55	108.91	108.11	once a week
53	4526	2248	Nesvady – Leveles	1316482.00	505754.00	109.39	108.46	daily average
54	4527	2249	Nesvady – chotář	1312609.85	505859.24	110.09	109.29	daily average
55	4325	500	Obid	1332223.30	464182.60	108.74	107.97	once a week
56	3930	502	Mužla	1330273.28	465452.23	119.70	119.04	once a week
57	3931	503	Obid	1331771.03	462891.63	120.03	119.25	once a week
58	3932	504	Obid	1328643.03	463119.78	127.06	126.26	once a week
59	3933	505	Štirove	1330035.00	460386.00	121.72	120.98	once a week

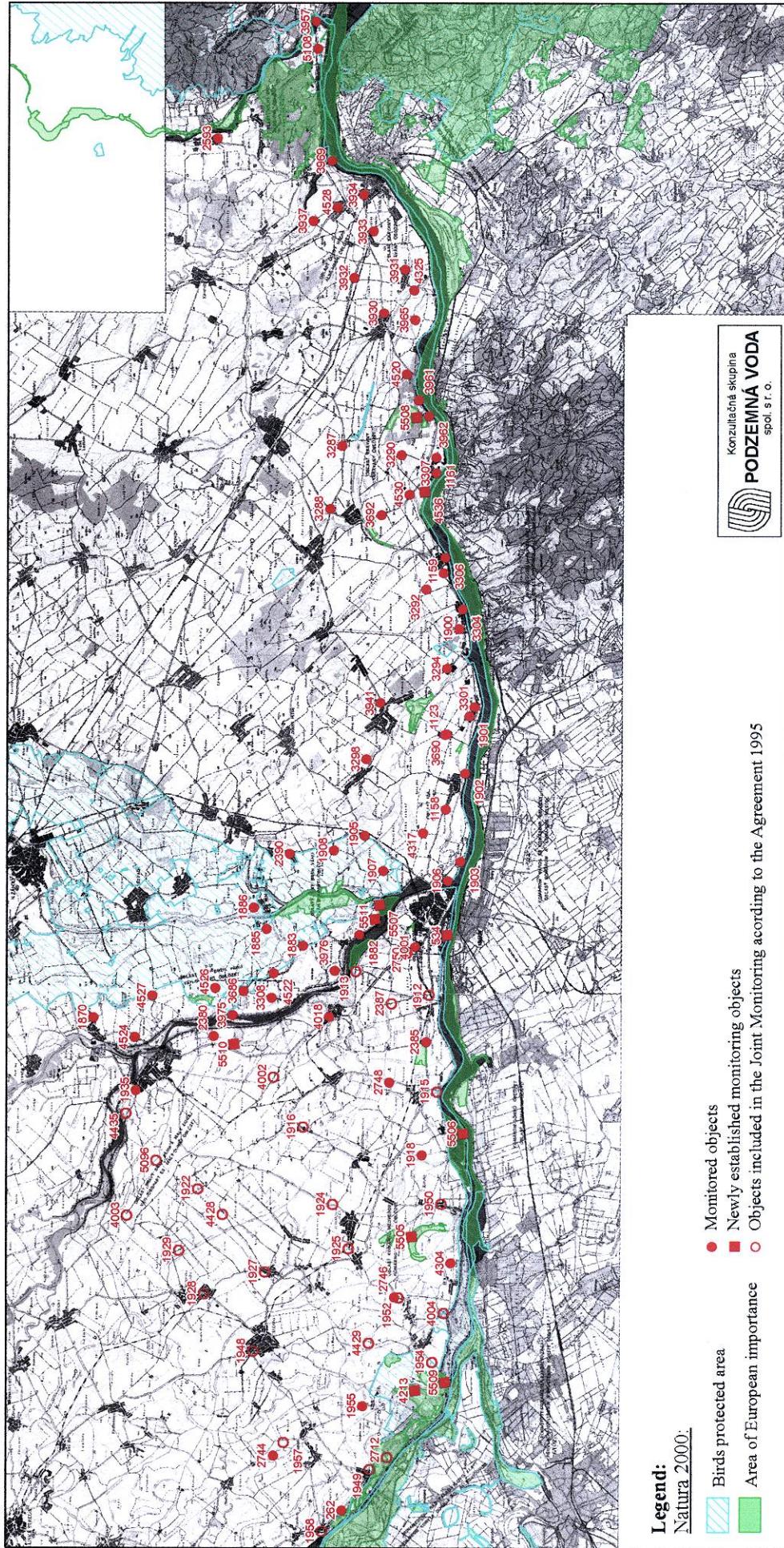
60	3934	506	Štúrovo	1329644.08	458133.78	108.83	108.36	daily average
61	4528	2507	Nana	1327990.89	458763.18	108.23	107.33	daily average
62	3937	511	Nana	1326443.00	459442.00	109.09	108.29	daily average
63	4520	2514	Mužla - Kenedeleš	1331334.10	469303.10	108.39	107.39	once a week
64	3287	516	Búč - Pereš pusta	1327022.00	473347.00	122.75	121.94	once a week
65	3288	518	Búč	1325957.98	477118.75	120.65	119.71	daily average
66	4530	2519	Kravany nad Dunajom - Mária dvor	1330892.93	476655.51	108.70	108.25	once a week
67	3290	520	Kravany nad Dunajom	1330590.00	474215.00	108.84	107.96	daily average
68	3292	522	Močská pusta	1331400.83	482559.85	110.74	109.94	daily average
69	1900	524	Radvaň nad Dunajom	1333187.00	485129.00	116.21	114.89	daily average
70	3294	525	Virt	1332271.00	487456.00	115.18	114.35	once a week
71	3941	526	Marcelová	1328040.59	489195.86	120.91	119.79	once a week
72	1123	529	Iža - Bokroš	1331788.12	491477.97	108.61	107.81	daily average
73	1901	2530	Patince	1333380.39	490499.58	110.09	109.29	daily average
74	3298	531	Chotín	1326896.54	492558.00	110.02	108.97	daily average
75	1902	532	Iža	1332814.49	493971.32	108.60	107.73	daily average
76	1903	533	Komárno - Malý Harčas	1332065.46	499299.63	109.18	108.40	daily average
77	4317	2534	Komárno	1329964.44	497375.71	109.22	108.50	daily average
78	1905	2535	Komárno – Kolož	1326381.96	497205.46	109.16	108.36	once a week
79	1906	536	Komárno - strelnica	1331198.44	500410.51	109.19	107.99	daily average
80	1907	2537	Komárno - Zámocká pusta	1327323.63	499469.05	109.30	108.42	once a week
81	1908	2538	Komárno - Komočín	1324432.76	497932.25	109.48	108.44	daily average
82	2593	820	Salka	1321021.01	453896.41	108.76	108.23	once a week
83	3957	869	Chľaba - ústie	1327642.79	447277.89	106.85	106	once a week
84	5108	2870	Chľaba - železničná stanica	1327615.94	448939.21	108.19	107.41	once a week
85	1158	6023	Iža	1331453.00	496043.00	107.70	106.95	once a week
86	1161	6026	Kravany nad Dunajom	1332715.00	474568.00	108.56	107.59	once a week
87	2390	7392	Hurbanovo - Holanovo	1321731.00	497921.00	109.51	109.41	once a week
88	3301	7405	Patince	1333757.00	489972.00	110.13	109.43	once a week
89	3304	7410	Radvaň nad Dunajom	1333501.00	483956.00	114.27	114.01	once a week
90	3306	7416	Moča	1332741.70	480720.88	109.98	109.01	once a week
91	3307	7422	Radvaň nad Dunajom	1332630.00	475482.00	109.53	108.59	once a week
92	3961	7425	Mužla	1331951.00	470955.00	108.15	107.14	once a week
93	3962	7426	Mužla	1332486.00	471980.00	109.86	109.44	once a week
94	3965	7432	Mužla	1332141.00	465999.00	107.11	106.16	daily average
95	3969	7445	Štúrovo	1327873.00	455905.00	107.25	106.45	once a week
96	3975	8094	Vrbová nad Váhom - Čergov	1317416.00	507494.00	110.40	109.04	once a week



97	3308	8096	Vrbová nad Váhom	1319879.00	506649.00	109.91	109.31	once a week
98	3976	8104	Komárno - Kava	1323841.00	505309.00	110.64	109.55	daily average
99	3686	MP-23	Vrbová nad Váhom	1318197.20	506078.15	109.31	108.45	once in 2 week
100	3690	MP-27	Iža	1331916.60	491475.98	107.74	106.91	once in 2 week
100	3692	MP-29	Búč	1329046.16	477751.62	109.89	109.12	once in 2 week
102	5511	L-29	Vrbová nad Váhom	1326561.71	502371.47			once in 2 week
103	5507	B-28	Kava	1326926.18	501522.06			once in 2 week
104	5508	B-30	Čenkov	1331685.34	472003.44			once in 2 week
105	4536	PZ-2/1	Kravany nad Dunajom	1331796.35	476566.24			daily average
106	1159	6024	Moča	1332553.00	481636.00	112.98	112.47	once a week

Monitoring of natural environment on the Sap-Budapest Danube section

Monitoring of ground water levels



Groundwater Quality Observation Objects

No.	Object No.	Object Name	Location	Coordinates			Surface (m a.s.l.)	Object type
				X JTSK	Y JTSK	Z (m a.s.l.)		

Sap - Komárno Section

Objects included in the Joint Monitoring according to the Agreement 1995

1	262	736590	Sap	1321483.10	538279.55	113.24	112.66	observation
2	265	736690	Klúčovec	1324165.97	533592.97	111.77	111.17	observation

Objects beyond the Joint Monitoring according to the Agreement 1995

3	493	HP-2	Sap	1319488.44	539395.80	-	-	water source
4	496	HG-2	Medved'ov	1322416.07	535933.89	-	-	water source
5	501	HK-2	Klúčovec	1323758.01	531609.71	-	-	water source
6	572	HT-1	Čičov – Trávnik	1326367.85	527400.03	-	-	water source
7	4454	HKN-1	Klížská Némá	1328352.50	525790.85	-	-	water source
8	1481	S-1 up to S-11	Komárno - Alžbetin ostrov	1330761.00	503882.60	-	-	water source
9	2384	738190	Zlatná na Ostrove	1328654.52	514879.82	109.76	109.16	observation
10	4001	260490	Komárno	1328876.74	504270.34	110.91	109.97	observation
11	4002	261190	Kameničná - Piesky	1319581.61	511485.27	109.65	108.73	observation

Komárno - Chľaba Section

12	4532	HGKŠ-6	Kravany nad Dunajom	1331800.00	476440.00	-	-	water source
13	4543	HVCH-2	Kováčov	13227459.00	451035.90	-	-	water source
14	4521	253890	Komárno - Komočín	1324432.76	497932.25	109.48	108.44	observation
15	4522	224490	Vŕbová nad Váhom - Veľký Kindeš	1320130.53	505158.46	110.17	109.37	observation
16	1158	602390	Iža	1331453.00	496043.00	107.70	106.95	observation
17	1123	52990	Iža - Bokroš	1331788.12	491477.97	108.61	107.81	observation
18	1159	602490	Moča	1332553.00	481636.70	112.98	112.47	observation
19	1161	602690	Kravany nad Dunajom	1332715.00	474568.00	108.56	107.59	observation
20	4520	251490	Mužla - Kenedeleš	1331334.10	469303.10	108.39	107.39	observation

List of Parameters

Water Temperature – T (°C)
pH (-)
Electric Conductivity at 25°C – EC25 (mSm ⁻³)
Dissolved Oxygen – O ₂ (mg l ⁻¹)
Oxygen Saturation – O ₂ (%)
Sodium – Na ⁺ (mg l ⁻¹)
Potassium – K ⁺ (mg l ⁻¹)
Calcium – Ca ²⁺ (mg l ⁻¹)
Magnesium – Mg ²⁺ (mg l ⁻¹)
Iron – Fe (mg l ⁻¹)
Manganese – Mn (mg l ⁻¹)
Ammonium ion – NH ₄ ⁺ (mg l ⁻¹)
Alkalinity – KNK _{4,5} (mmol l ⁻¹)
Hydrogen carbonates – HCO ₃ ⁻ (mg l ⁻¹), calculated from Alkalinity
Chlorides – Cl ⁻ (mg l ⁻¹)
Sulphates – SO ₄ ²⁻ (mg l ⁻¹)
Nitrates – NO ₃ ⁻ (mg l ⁻¹)
Phosphates – PO ₄ ³⁻ (mg l ⁻¹)
Chemical Oxygen Demand – COD _{Mn} (mg l ⁻¹)

At selected observation sites

Arsenic – As (µg l ⁻¹)
Cadmium – Cd (µg l ⁻¹)
Cromium – Cr (µg l ⁻¹)
Copper – Cu (µg l ⁻¹)
Mercury – Hg (µg l ⁻¹)
Nickel – Ni (µg l ⁻¹)
Lead – Pb (µg l ⁻¹)
Zinc – Zn (µg l ⁻¹)

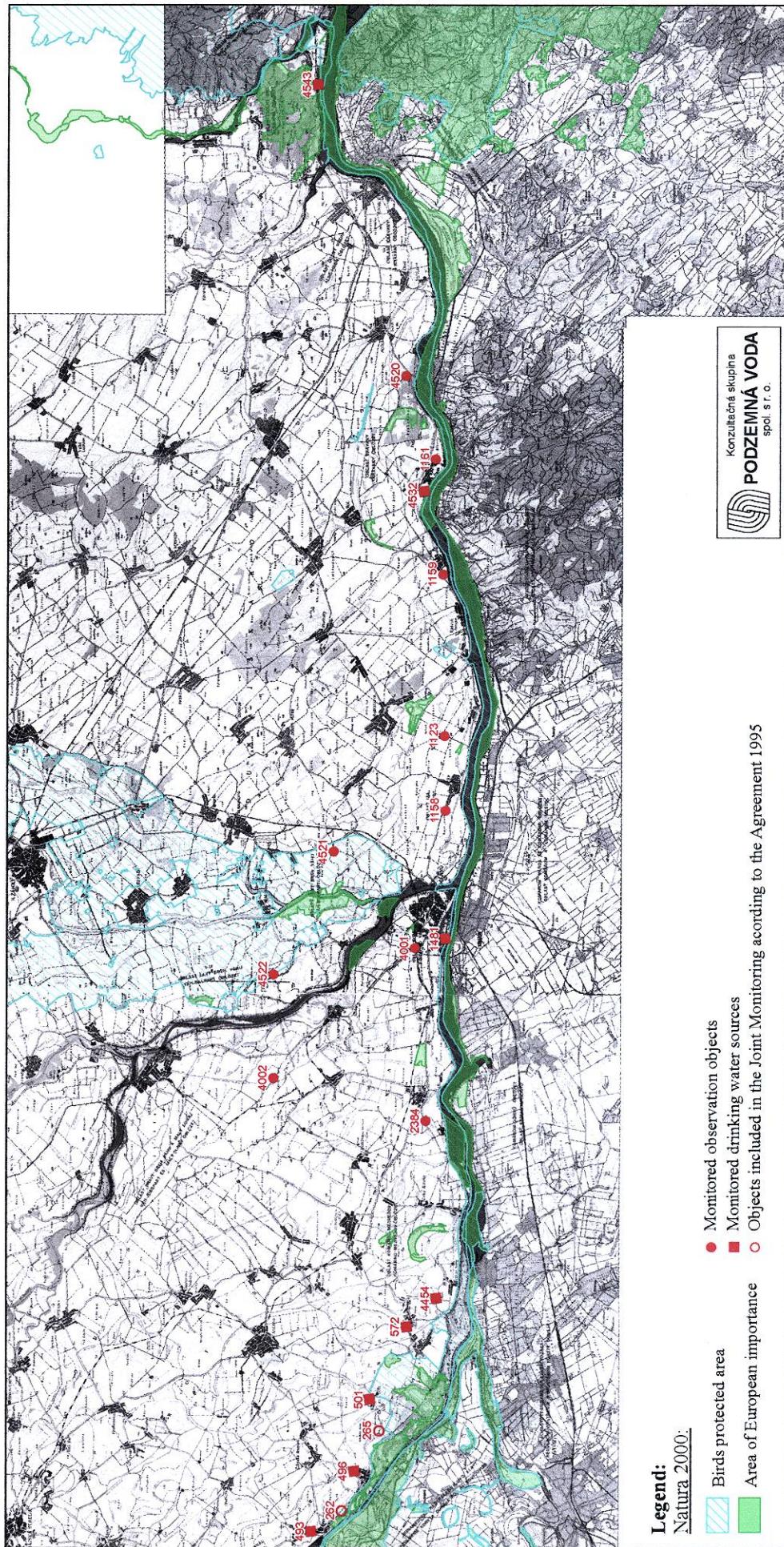
Frequency:

4 times per year
in case of heavy metals – once in a year



Monitoring of natural environment on the Sap-Budapest Danube section

Monitoring of ground water quality



Legend:
Natura 2000:

- Birds protected area
- Area of European importance
- Monitored observation objects
- Monitored drinking water sources
- Objects included in the joint Monitoring according to the Agreement 1995



Soil Observation Sites

No.	Object No.	Object Name	Location	Coordinates		Observed parameters		
				X JT SK	Y JT SK	PCHP	SM	SP
Sap - Komárno Section								
1	2632	MP-12	Čiližská Radvan		1317567.70	534573.28	•	•
2	2634	MP-14	Trávnik		1325781.80	525541.60	•	•
3	2636	MP-16	Zlatná na Ostrove		1326593.11	512413.48	•	•
4	2638	MP-18	Komárno		1328381.37	504632.78	•	•
Komárno - Ch'rába Section								
5	2643	MP-23	Vrbová nad Váhom		1318199.20	506078.15	•	•
6	2647	MP-27	Iža		1331916.60	491475.98	•	•
7	2649	MP-29	Búč		1329046.16	477751.62	•	•

Legend: PCHP – Physical-Chemical Parameters

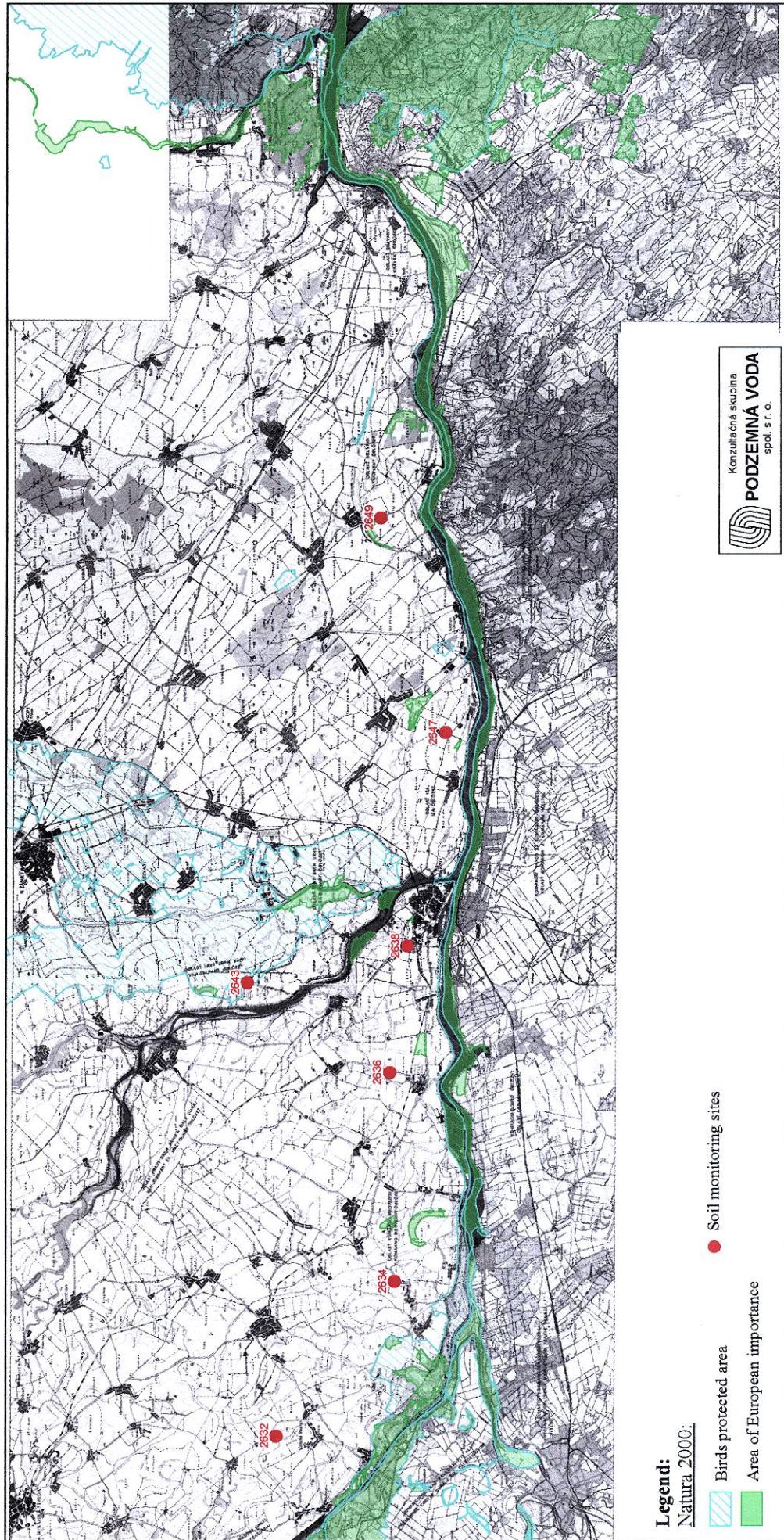
- specific and volumetric weight, total porosity, capillary and non capillary porosity
 - maximal capillary water capacity, retention water capacity,
 - withering point, point of decreased availability

SM – Soil Moisture
 SP – Salinization Processes

- volumetric soil water content
 - specific soli water electric conductivity, sodium saturation degree,
 - saturated soil paste analysis, electric conductivity of the ground water
 - determination of oxidizable carbon, fulvo acids, humic acids
 - humification degree, type of humus regime

Monitoring of natural environment on the Sap-Budapest Danube section

Monitoring of soil characteristics



Forest Monitoring Sites

No.	Object No.	Object Name	Location	Coordinates				Observed parameters			
				X JTISK	Y JTISK	PCHP	SM	BM	HS	FYTO	
Sap – Komárno Section											
1	3802	L-25	Medved'ov	1323198.83	536941.81	•	•	•	•	•	•
2	3803	L-26	Klúčovec	1325674.23	534545.83	•	•	•	•	•	•
3	3817	L-27	Číčov	1328417.07	531063.38	•	•	•	•	•	•
4	3818	L-28	Kolárovo - Čergov	1317316.56	509284.53	•	•	•	•	•	•
Komárno - Chľaba Section											
5	3819	L-29	Komárno - Kava	1326560.87	502368.39	•	•	•	•	•	•
6	3820	L-30	Čenkov	1331922.71	471655.23	•	•	•	•	•	•

Legend:

PCHP – Physical-Chemical Soil Parameters

SM – Soil Moisture

BM – Biometric Measurements

HS – Health State

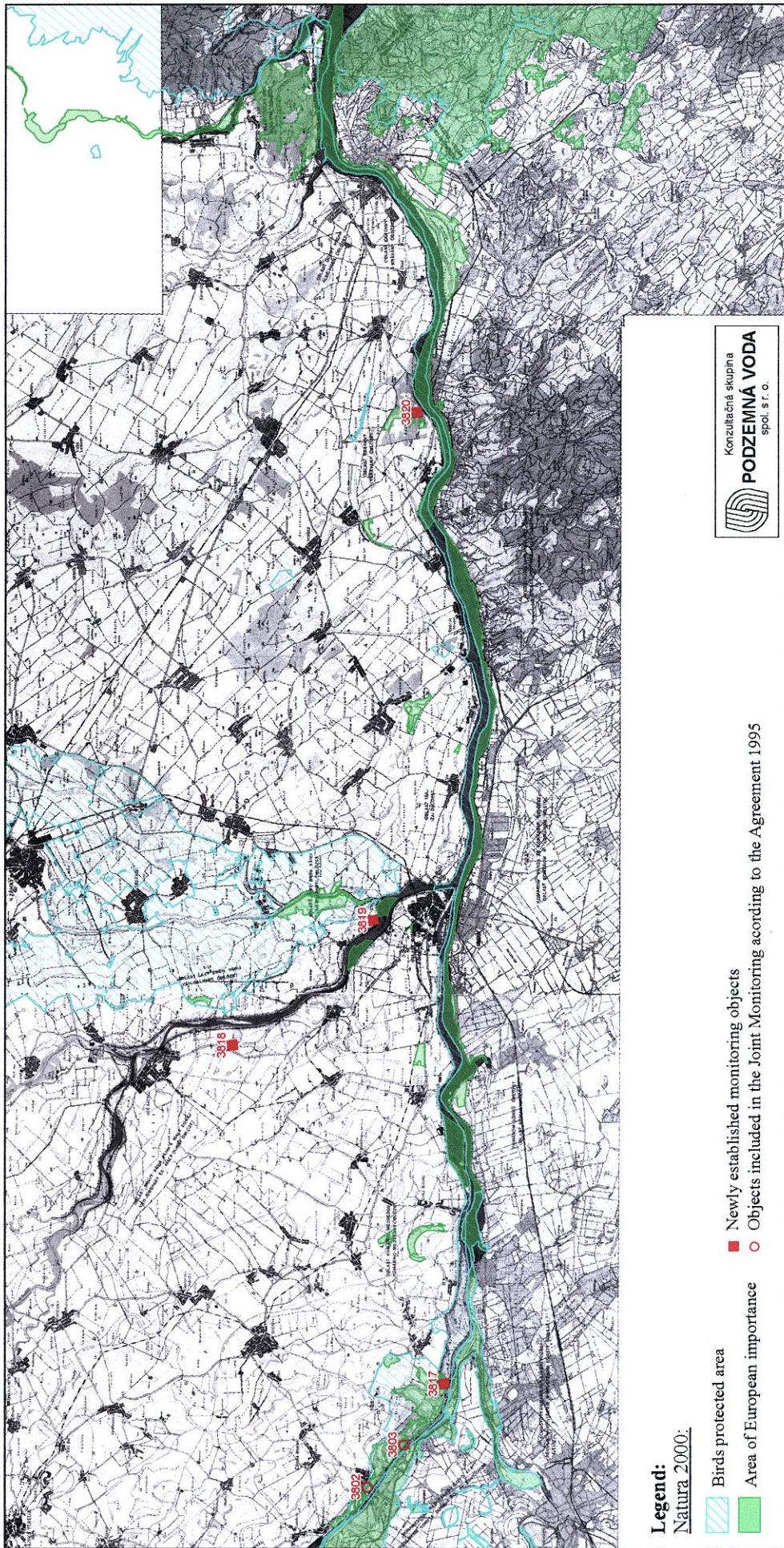
FYTO – Ecoanalysis of the Plant Layer

- volumetric soil water content
- thickness and height measurements
- health state of the forest stands
- species composition and coverage of the plant layer



Monitoring of natural environment on the Sap-Budapest Danube section

Monitoring of forest



Biological Monitoring Sites

No.	Object No.	Object Name	Location	Coordinates		Observed parameters				
				X JTSK	Y JTSK	FYTO	SM	TER	MFYT	AQUA
Sap – Komárno Section										
1	2609	B-15	Sap - Erčed ^d		1319853.00	541202.00	•	-	•	•
2	2612	B-18	Klúčovec - Sporná sihoť		1324498.00	535451.00	•	•	•	•
3	2617	B-23	Čičov - Starý les		1326741.00	532638.00	•	-	•	•
4	5512	B-26	Velký Lél - Veľkoléšky ostrov		1330814.72	515914.00	•	•	•	•
Komárno - Chľaba Section										
5	5513	B-28	Komárno - Apáli		1326923.19	501548.04	•	•	•	•
6	5514	B-30a	Čenkov - Čenkovský les		1331580.19	472006.79	•	•	•	•
7	5515	B-30b	Čenkov - Čenkovská lesostep		1331781.25	472017.37	•	•	-	-
8	5516	B-31	Mužla - Mužianska sihoť		1332639.00	467286.00	•	-	•	•
9	5519	B-34	Chľaba - Ipel ^f		1325861.00	449342.00	•	-	•	-
10	5520	B-35	Chľaba – sútok Dunaja a Ipľa		1328443.00	447987.00	-	-	-	•

Legend:

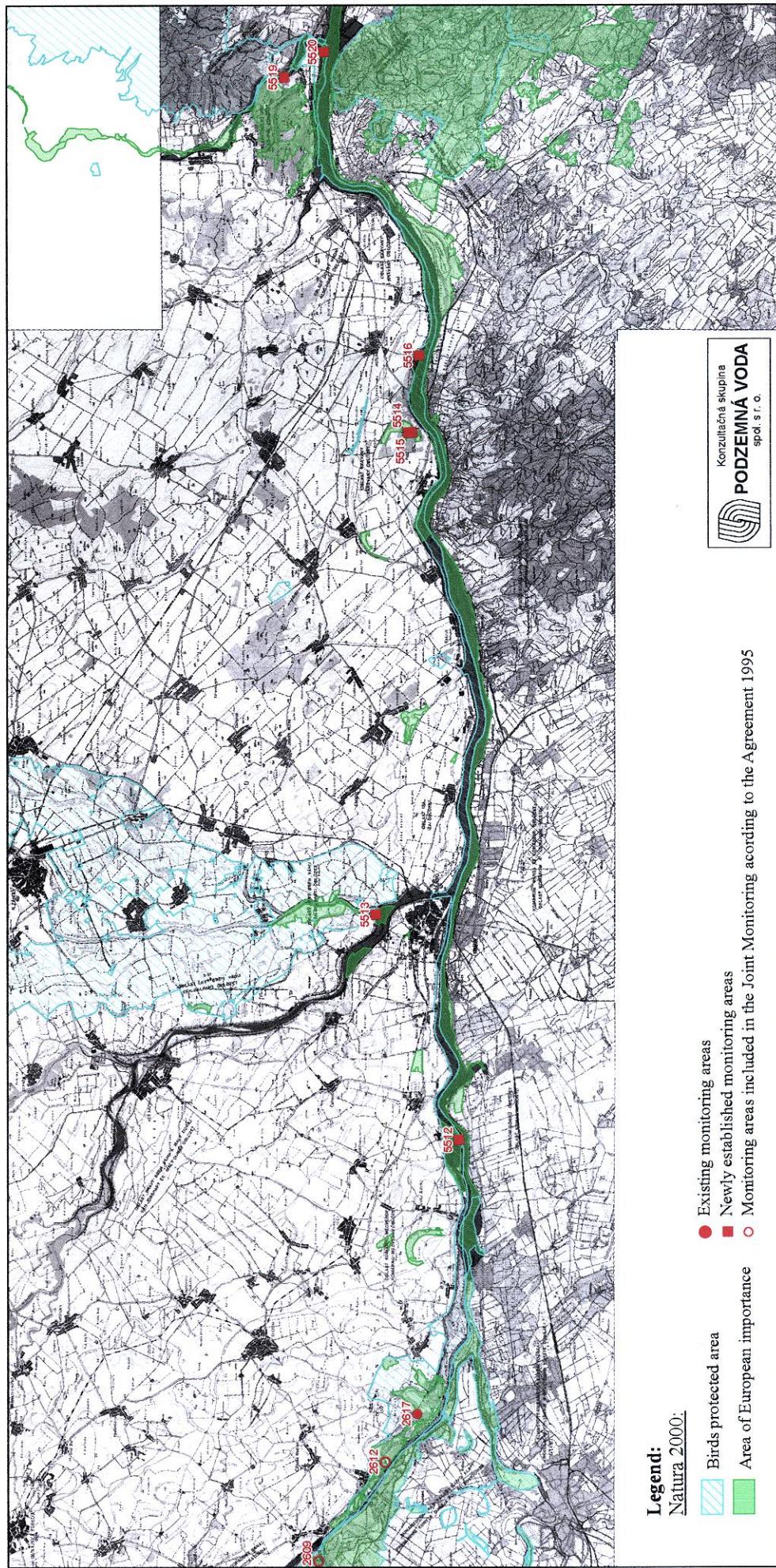
FYTO – Phytocoenology
 SM – Soil Moisture
 TER – Terrestrial Fauna
 MFYT – Macrophytes
 AQUA – Aquatic Fauna

- species composition and coverage of the plant layer , twice a year
 - volumetric soil water content
 - Gastropoda
 - Braun-Blanquet and Kohler methods
 - Aquatic Molluscs
 - Ephemeroptera
 - Trichoptera
 - Odonata
 - Cladocera
 - Copepoda
 - Osteichtyes
 - Macrozoobenthos
 - Microzoobenthos



Monitoring of natural environment on the Sap-Budapest Danube section

Biological monitoring



Area of European importance