

INFORMATION SHEET OF ATANASOVSKO LAKE RAMSAR SITE

APPENDIX 1. TABLES

Table 1. Contents of chemical compounds in water samples taken from Atanasovsko Lake reserve

No of Site	Month	Salinity	HCO <sub>3</sub> <sup>-</sup>	Ca <sup>2+</sup>	Mg <sup>2+</sup>	Alkalinity	Hard-ness	PH		Oxygen	
		0/∞	mg/l	mg/l	mg/l	Mgeqv/l	°d		°C	Mg/l	%
1	May	0.12	298.9	60.1	35.3	4.9	16.5	7.6	25.5	12.00	149.1
2	May	0.12	378.2	72.1	35.3	6.2	18.2	7.5	21.0	15.04	173.3
3	May	0.18	353.8	70.1	40.1	5.8	19.1	8.8	22.0	21.28	249.5
4	May	0.15	359.9	60.1	42.6	5.9	18.2	7.6	21.0	8.80	101.4
	July	17.65	195.2	200.4	644.5	3.2	176.7	7.6	27.0	7.60	96.7
5	April	5.21	274.5	50.1	255.4	4.5	65.9	-	-	-	-
	May	7.34	366.0	80.2	389.1	6.0	100.9	8.2	24.0	6.96	84.4
6	April	19.83	207.4	210.4	912.0	3.4	239.7	-	-	-	-
	May	22.26	305.0	220.4	1057.9	5.0	274.8	8.6	24.5	4.80	58.7
	April	20.44	195.2	210.4	954.6	3.2	249.6	-	-	-	-
7	May	23.18	286.7	260.5	1057.9	4.7	280.4	8.5	24.0	4.48	54.3
	July	32.66	262.3	340.7	1349.8	4.3	358.9	8.8	27.0	5.70	72.5
	April	22.87	201.3	240.5	1039.7	3.3	273.4	-	-	-	-
8	May	24.70	213.5	260.5	1155.2	3.5	302.8	8.6	22.0	8.00	93.8
	July	50.29	292.8	420.8	2225.3	4.8	572.0	8.4	25.5	2.20	27.4
	April	25.61	274.5	250.5	1130.9	4.5	295.8	-	-	-	-
9	May	26.22	311.1	260.5	1216.0	5.1	316.9	8.6	21.5	6.08	70.6
	July	53.55	402.6	360.7	2371.2	6.6	597.3	8.8	25.8	7.75	96.8
	April	25.31	280.6	250.5	1130.9	4.6	295.8	-	-	-	-
10	May	24.40	329.4	260.5	1106.6	5.4	291.6	8.6	22.5	10.16	120.1
	July	58.12	366.0	400.8	2577.9	6.0	650.5	8.5	27.0	8.44	107.3
	April	24.40	231.8	250.5	1106.6	3.8	290.2	-	-	-	-
11	May	26.53	298.9	260.5	1216.0	4.9	316.9	8.6	21.2	6.24	72.1
	July	52.24	329.4	440.9	2371.2	5.4	608.5	8.4	32.5	7.75	106.6

Table1. (cont.)

No of Station	Month	Oxyda-bility	NH <sub>4</sub> -N	NO <sub>2</sub> -N	NO <sub>3</sub> -N	PO <sub>4</sub> -P	Si
		mgO <sub>2</sub> /l	mgN/l	mgN/l	mgN/l	mgP/l	mg/l
1	May	14.4	0.395	0.007	0.690	0.342	1.848
2	May	11.2	0.332	0.008	0.310	0.425	2.515
3	May	14.8	0.364	0.003	0.248	0.515	4.229
4	May	11.6	0.465	0.024	0.297	0.577	2.553
	July	6.0	0.072	0.003	0.065	0.040	0.686
5	April	-	-	-	0.248	-	1.181
	May	22.4	0.211	0.007	0.224	0.088	0.876
6	April	-	-	-	0.175	-	0.343
	May	18.4	0.237	0.003	0.126	0.204	1.029

	April	-	-	-	0.371	-	0.762
7	May	20.0	0.218	0.026	0.261	0.190	1.067
	July	22.4	0.110	0.004	0.065	0.182	0.819
	April	-	-	-	0.199	-	1.524
8	May	16.8	0.161	0.004	0.150	0.121	1.353
	July	20.8	0.237	0.005	0.065	0.432	2.572
	April	-	-	-	0.224	-	0.686
9	May	22.0	0.268	0.003	0.175	0.062	0.705
	July	30.0	0.110	0.005	0.138	0.045	0.495
	April	-	-	-	0.371	-	0.610
10	May	27.2	0.256	0.008	0.199	0.059	2.000
	July	29.2	0.268	0.007	0.114	0.046	1.048
	April	-	-	-	0.273	-	1.791
11	May	18.4	0.199	0.003	0.212	0.114	0.953
	July	27.6	0.205	0.004	0.052	0.389	1.753

**Table 2.** Meteorological Data for Atanasovsko Lake, January - June (data from Burgas Airport Meteorological Station)

<i>INDEX/ MONTH</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>V</i>	<i>VI</i>
Average monthly temperature °C	1.77	3.2	6.55	10.56	14.36	19.69
Average max. temperature °C	6.5	8.7	12.27	16.48	19.69	24.74
Average min. temperature °C	-2.19	-2.05	2.3	5.81	8.93	14.57
Average from the absolute max. T °C	13.9	18.06	21.16	25.72	28.82	31.4
Average from the absolute min. t °C	-10.15	-9.5	-3.35	1.33	2.8	9.18
Absolute min. T °C	-13.3	-14.4	-6.50	0.1	1.4	5.9
Absolute max. T °C	14.9	23.3	24	28.4	31.7	34.9
Aver. Monthly humidity %	82	80	79	77	77	75
Aver. Monthly rainfall (5 year) mm	4.1	14.3	19.55	44.85	47.98	56.3
Aver. Monthly rainfall (15 year) mm	42.3	34.8	35.2	44.2	36.9	41.9
Aver. Monthly rainfall from Burgas	45	42	35	44	48	56
24-hour max. Rainfall mm	104	71.1	95.8	100.2	96.5	91.7
Aver. No. of days with rainfall	8	8	10	13	14	11
Aver. No. of days with snow cover	5	4	2	0	0	0
Aver. No. of days with rainfall >1 mm	6.1	5.8	4.8	6.2	6.6	5.7
Aver. No. of days with rainfall >10 mm	1.1	0.9	0.8	1	1.1	1.3
Aver. No. of days with rainfall >15 mm	0.5	0.3	0.3	0.4	0.7	0.6
Aver. No. of days with rainfall >25 mm	0.1	0.1	0.1	0.1	0.2	0.4
Number of days with clear skies	4.5	3.83	4.5	4.92	6.42	10.3
Number of cloudy days	19.5	20.4	21.5	16.66	9.33	5.6
Average	5.8	5.7	5.6	5.1	4.2	3.6
Number of days with thunder storms	0.07	0.4	0.27	1.47	4.93	7.2

**Table 2. (cont.).** Meteorological Data for Atanasovsko Lake, July - December (data from Burgas Airport Meteorological Station)

<i>INDEX/ MONTH</i>	<i>VII</i>	<i>VIII</i>	<i>IX</i>	<i>X</i>	<i>XI</i>	<i>XII</i>	<i>Year</i>
Average monthly temperature °C	22.8	22.8	18.3	13.2	7.14	2.42	
Average max. T °C	28.2	28.1	24.7	19.5	13.24	6.71	
Average min. t °C	18.3	18.7	13.2	8.57	3.46	-0.54	
Average from the absolute max. T °C	33.3	33.1	30.3	29.5	21.08	15.22	
Average from the absolute min. t °C	13.3	11.4	6.9	0.58	-4.8	-8.78	
Absolute min. t °C	11.5	10.3	5.4	-4.2	-8.6	-12.3	
Absolute max. T °C	37.7	33.9	33.1	33.4	24.2	18	

Aver. Monthly humidity %	71	70	72	74	79	82	77
Aver. Monthly rainfall (5 year) mm	62.1	11.1	22.6	63.7	57.58	39.78	
Aver. Monthly rainfall (15 year) mm	29.3	24.4	28.8	27.5	47.7	36.2	35.6
Aver. Monthly rainfall from Burgas	40	29	36	47	60	58	45.25
24-hour max. rainfall mm	66.6	83.9	139	70.5	85.1	67	52.5
Aver. No of days with rainfall	8	6	7	9	12	11	
Aver. . No. Of days with snow cover	0	0	0	0	0	2	
Aver. . No. Of days with rainfall >1 mm	4.3	3.1	3.1	4.6	6.2	6.4	62.9
Aver. No. Of days with rainfall >10 mm	1	0.9	0.7	1.2	1.8	1.4	13.2
Aver. No of days with rainfall >15 mm	0.5	0.4	0.5	0.6	0.9	0.8	6.5
Aver. No. Of days with rainfall >25 mm	0.2	0.2	0.2	0.2	0.3	0.3	2.4
Number of days with clear skies	16.4	16.2	9.5	6	4.92	4.92	
Number of cloudy days	3.42	375	9.16	15.8	19.75	19.8	
Average	2.8	2.7	2.9	3.9	5	5.4	4.4
Number of days with thunder storms	5.73	3.47	1.53	0.67	0.13	0.07	

**Table 3.** Main limnological features of the Atanasovsko Lake

<i>Characteristics</i>	<i>Source</i>	<i>Value</i>
Altitude (m)		From 0 to minus 1,50
Catchment area (km <sup>2</sup> )		109
Length of the shore line of the reserve (km)		23,7
Length of the shore line of Atanasovsko Lake (km)		?
Area of the reserve (ha)		1050
Area of Atanasovsko lake (ha),		1690
Volume of the lake (km <sup>3</sup> )		3,2
Maximum depth		
Annual inflow (m <sup>3</sup> )		6,870,000
Retention time (months)		

**Table 4.** Qualitative and quantitative composition of the ichthyofauna in the “Atanasovsko Lake” Reserve (1- primary freshwater, 2- primary marine, 3- constant inhabitants of the reserve, 4- reproducing in the basins of the reserve, 5- relative quantity at five degree scale, 6- included in the Red Book of Bulgaria).

<i>Species</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>
<b>Cyprinidae</b>						
<i>Carassius auratus gibelio</i>	+		+	+	3	
<i>Cyprinus carpio</i>	+		+		1	
<b>Atherinidae</b>						
<i>Atherina boyery</i>		+			1	
<b>Gasterosteidae</b>						
<i>Gasterosteus aculeatus</i>		+		+	4	+
<i>Pungitius platigaster</i>		+		+	3	+
<b>Gobiidae</b>						
<i>Knipowitschia caucasica</i>		+	+	+	5	+
<i>Neogobius melanostomus</i>		+				
<b>Poecilidae</b>						
<i>Gambusia affinis holbrooki</i>	+		+	+	5	
<b>Blennidae</b>						
<i>Parablennius sanguinolentus</i>		+			1	
<b>Sygnathidae</b>						
<i>Sygnathus typeargentatus</i>		+			1	
<b>Mugilidae</b>						
<i>Mugil cephalus</i>		+	+		2	
<i>Lisa aurata</i>		+	+		2	

<i>Lisa saliens</i>		+	+		2	
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**Table 5.** Species composition of amphibians and reptiles in Atanasovsko Lake.

AMPHIBIA	REPTILIA
<i>Rana ridibunda</i>	<i>Ophisaurus apodus</i>
<i>Bufo viridis</i>	<i>Elaphe longissima</i>
	<i>Emys orbicularis*</i>
<i>Pelobates fuscus*</i>	<i>Lacerta viridis*</i>
<i>Triturus vulgaris*</i>	<i>Lacerta agilis*</i>
<i>Triturus cristatus*</i>	<i>Natrix tessellata*</i>
<i>Hyla arborea*</i>	<i>Natrix natrix*</i>
	<i>Coluber jugularis*</i>

**Table 6.** Long-term changes in numbers of the Avocet in Atanasovsko Lake (1910 -1996)

Year	Breeding Pairs	Reported By	Comments
< 1910	No	Varbanov (1912, 1934)	
1910	Few	Varbanov (1912, 1934)	
1932	5 - 6 ind.	Harrison, Pateff (1933)	
1938	2 ind.	Jordans (1940)	
1955	25	Balat (1962)	
1960	500 – 750 ind.	Mountfort,Ferguson-Lees(1961)	
1962	250 ind.	Doncev (1963)	
1963	170 – 200 ind.	Marinov, Minchev (1964)	
1964	> 200	Michev (1985)	
1968	148	Georgiev (1976)	
1972-78	760 - 2200	Nankinov, Darakchiev (1978)	
1977	600	Michev (1985)	
1978	1037	Nankinov, Darakchiev (1978)	957 in reserve, 80 in buffer zone
1980	373	Michev (1985)	
1994	570	Assenov (in litt.)	
1995	545	Michev, Dimitrov, Niagolov, Marinov (in litt.)	307 in reserve, 238 in buffer zone
1996	440	Michev, Dimitrov, Niagolov (in litt.)	169 in reserve, 271 in buffer zone

**Table 7.** Numbers of colonial breeding Birds in Atanasovsko Lake (1993 - 1996).

Species	Place	1993	1994	1995	1996
<i>Recurvirostra avosetta</i>	Dykes in the reserve	97	240	263	122
	Artificial. platforms in the reserve	138	113	44	34
	Artificial platforms in the buffer zone	?	?	19	13
	Dykes and islets in the buffer zone	259	359	219	271
	<b>Total</b>	<b>494</b>	<b>712</b>	<b>545</b>	<b>440</b>
<i>Himantopus himantopus</i>	Dykes in the reserve		12		
	Dykes in the buffer zone	52	51	71	94
	<b>Total (Buffer zone)</b>	<b>52</b>	<b>63</b>	<b>71</b>	<b>94</b>
<i>Charadrius alexandrinus</i>	Buffer zone			30	9
	Dykes in the reserve			Over 50	12
	<b>Total</b>			<b>80</b>	<b>16</b>
<i>Gelochelidon nilotica</i>	Dykes in the reserve			7	6
	Dykes in the buffer zone	5	8		

	<b>Total</b>	<b>5</b>	<b>8</b>	<b>7</b>	<b>6</b>
<i>Sterna sandvicensis</i>	<b>Total (artificial platforms in the reserve)</b>	<b>1161</b>	<b>1149</b>	<b>772</b>	<b>360</b>
<i>Sterna hirundo</i>	Dykes in the reserve	19	4		
	Artificial platforms in the reserve		85	25	10
	Dykes in the buffer zone	292	741	89	48
	<b>Total</b>	<b>311</b>	<b>830</b>	<b>114</b>	<b>58</b>
<i>Sterna albifrons</i>	Dykes in the reserve	12	16		29
	Dykes in the buffer zone	22	142	18	5
	<b>Total</b>	<b>34</b>	<b>158</b>	<b>18</b>	<b>34</b>
<i>Larus melanocephala</i>	Total (artificial platforms in the reserve)	1	62	35	6

**Table 8.** Midwinter Numbers of Water Birds in Atanasovsko Lake

<i>Species</i>	Year		
	<i>1995</i>	<i>1996</i>	<i>1997</i>
<i>Podiceps cristatus</i>	19955	-	34
<i>Podiceps nigricollis</i>	25	197	202
<i>Pelecanus crispus*</i>	54	83	6
<i>Phalacrocorax carbo</i>	17	1	140
<i>Phalacrocorax pygmeus</i>		4	7
<i>Ardea cinerea</i>			4
<i>Egretta alba</i>	39	43	10
<i>Egretta garzetta</i>			1
<i>Botaurus stellaris</i>			1
<i>Anser albifrons</i>	2250		5540
<i>Anser anser</i>	11		11
<i>Branta ruficollis</i>			380
<i>Cygnus cygnus</i>	5	1	
<i>Cygnus olor</i>	34	155	753
<i>Tadorna tadorna*</i>	1102	1555	2498
<i>Tadorna ferruginea</i>			2
<i>Anas penelope</i>		180	2034
<i>Anas crecca</i>	58	165	240
<i>Anas platyrhynchos</i>	428	250	1197
<i>Anas acuta</i>	27	67	410
<i>Anas clypeata</i>	61	3	230
<i>Aythya ferina</i>	926	40	1210
<i>Aythya fuligula</i>	323	7	72
<i>Bucephala clangula</i>		7	
<i>Mergus albellus</i>	4		9
<i>Mergus serrator</i>	3		145
<i>Anatinae spp.</i>		102	
<i>Rallus aquaticus</i>	1	3	3
<i>Galinula chloropus</i>		3	
<i>Fulica atra</i>	555	928	4450
<i>Pluvialis squatarola</i>			7
<i>Numenius arquata</i>	15	7	11
<i>Tringa totanus</i>	1		29
<i>Calidris alba</i>	2		
<i>Calidris alpina</i>		35	53
<i>Calidris minuta</i>	106		
<i>Philomachus pugnax</i>			4
<i>Larus canus</i>			32

<i>Larus cachinans</i>	103	17	206
<i>Larus ridibundus</i>	61	7	275
<i>Larus genei</i>		24	
<i>Larus minutus</i>	1		
<b>TOTAL</b>	<b>6217</b>	<b>3884</b>	<b>20206</b>

\*Species with wintering numbers of international importance

**Table 9.** Birds species, which midwinter Numbers in Atanasovsko Lake has international Importance.

Species	Max. Count	Year of Max.	Average Count
<i>Tadorna tadorna</i>	4141	1982	1987
<i>Anas penelope</i>	6014	1976	326
<i>Aythya nyroca</i>	91	1967	-

**Table 10.** Species composition of mammalian fauna of the Reserve “Atanasovsko Lake” and adjacent areas.

Species	Based on Literature data	Based on Inquiry		Personal data	
		Reserve	Adjacent areas	Reserve	Adjacent areas
<i>Crocidura leucodon</i>	Simeonov et al., 1981			+	+
<i>Crocidura russula</i>	Simeonov et al., 1981				
<i>Crocidura suaveolens</i>	Simeonov et al., 1981			+	+
<i>Suncus etruscus</i>	Popov, Nyagolov, 1991				
<i>Neomys fodiens</i>	Simeonov et al., 1981				
<i>Talpa europaea</i>	Simeonov et al., 1981				+
<i>Erinaceus concolor</i>					+
<i>Plecotus sp.</i>	Simeonov et al., 1981				
<i>Nyctalus noctula</i>	Simeonov et al., 1981				
<i>Lepus europaeus</i>					+
<i>Spermophilus citellus</i>			+		+
<i>Muscardinus avellanarius</i>	Simeonov et al., 1981				
<i>Micromys minutus</i>	Simeonov et al., 1981				
<i>Apodemus sylvaticus</i>	Simeonov et al., 1981			+	+
<i>Apodemus flavicollis</i>	Simeonov et al., 1981				
<i>Apodemus agrarius</i>	Simeonov et al., 1981				
<i>Mus musculus</i>	Simeonov et al., 1981				
<i>Mus spicilegus</i>				+	+
<i>Rattus rattus</i>	Simeonov et al., 1981				
<i>Rattus norvegicus</i>	Simeonov et al., 1981				
<i>Microtus arvalis</i>	Simeonov et al., 1981				
<i>M. rossiaemeridionalis</i>				+	+
<i>Microtus guentheri</i>	Simeonov et al., 1981				
<i>Arvicola terrestris</i>	Simeonov et al., 1981				
<i>Canis aureus</i>			+		
<i>Vulpes vulpes</i>		+	+	+	+
<i>Nictereutes procyonoides</i>			+		
<i>Felis silvestris</i>		+			
<i>Mustela nivalis</i>		+		+	+
<i>Putorius putorius</i>			+		
<i>Martes foina</i>				+	+
<i>Lutra lutra</i>		+			
<i>Sus scrofa</i>		+		+	
Wandering dogs				+	+
Domestic cats				+	+

**Table 11.** Territorial distribution and relative abundance of small mammals (number of animals per 100 traps/24 hours) determined by the method of trap lines

Place	Plant Community	Species	Relative Abundance	
			July	October
1	<i>Agropyrum intermedium</i>	<i>Apodemus sylvaticus</i>	2	
		<i>Crocidura leucodon</i>	3	
6	<i>Lolium perennae</i>	<i>Mus sp.</i>		6.7
		<i>Apodemus sylvaticus</i>		1.2
		<i>Microtus rossiaemeridionalis</i>		2.2
		<i>Crocidura leucodon</i>		0.7
7	<i>Festuca pratensis - Lolium perennae</i>			0
8	<i>Typha angustifolia</i>	<i>Apodemus sylvaticus</i>		10
9	<i>Festuca pratensis - Lolium perennae</i>	<i>Mus spicilegus</i>		9.4
		<i>Apodemus sylvaticus</i>		3.1
14	<i>Poa silvicola - Cynodon dactylon</i>	<i>Microtus rossiaemeridionalis</i>		10
2	<i>Festuca pseudovina - Agropyrum intermedium</i>	<i>Mus spicilegus</i>	1	4.2
		<i>Microtus rossiaemeridionalis</i>	1	6.7
		<i>Crocidura leucodon</i>	6	5.1
		<i>Crocidura suaveolens</i>	3	3.3
3	<i>Suedamaritima - Artemisia maritima - Chenopodium</i>		0	
4	<i>Argyropyrum intermedium - Artemisia maritima</i>		0	
5	<i>Festuca pseudovina - Agropyrum intermedium</i>	<i>Mus spicilegus</i>	0	2.7
		<i>Microtus rossiaemeridionalis</i>	1.25	3.3
		<i>Crocidura leucodon</i>	0	2.0
10	<i>Sueda maritima - Chenopodium botris</i> with areas of <i>Salicornia europaea</i>	<i>Mus spicilegus</i>		4.0
11	<i>Argyropyrum intermedium - Artemisia maritima</i>	<i>Crocidura leucodon</i>		13.3
12	<i>Phragmites australis</i>	<i>Crocidura Leucodon</i>		12
		<i>Crocidura suaveolens</i>		4
13	<i>Sueda maritima - Artemisia maritima - Chenopodium</i>	<i>Apodemus sylvaticus</i>		10

**Remark:** The plant communities are determined by V. Velev (Bulgarian Academy of Sciences).