

STUDY FOR IDENTIFYING AND LOCATING THE HABITATS FOR BIRDS PROVIDED BY SOME ARTIFICIAL LAKES IN NORTH-WEST ROMANIA (ADRIAN, VÂRȘOLȚ AND CĂLINEȘTI OAȘ)

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Abstract: The research presented in this paper is part of the research carried out for my doctoral thesis. This research presents the vegetation of the artificial lakes, Adrian, Vârșolț and Călinești Oaș. These artificial lakes are recent (during the last 40-50 years) and are located in North-West Romania. These lakes vegetation is very important for clarifying the possibility for these artificial ecosystems take the role of the natural aquatic ecosystems for the birds' population. Regarding the bird's population, the lakes role is to provide food, shelter and proper place for nesting. In the initial stage, these lakes lacked vegetation; therefore my research wishes to highlight the level of coverage with vegetation of their banks and borders of the water. Moreover, I wanted to present the habitats given for birds by these ecosystems. At the presented vegetal associations, I also mention the Code I (HdR) according to the paper by Doniță et al., - "Habitatele din România" – *Habitats of Romania*, (2005).

Keywords: site vegetation, habitats, vegetal associations

INTRODUCTION

This research presents the vegetation by the lakes according to the studied literature and own observations, being helped in identifying the vegetal species and associations by the biologist Károl Karácsonyi, whom I would like to thank a lot too. I have made the presentation of the aquatic ecosystems vegetation of the artificial lakes and neighbouring systems in order to emphasise the habitats provided for the birds. The basic literature I have used is represented by the works of Karácsonyi (1995), Burescu (2002) and also by tome 2 "Patrimoniul natural al Sălajului – Flora" – *The Natural Heritage of Salaj – the Flora*, coordinators Negrean and Karácsonyi (2017), volume resulted after the research project on historical Sălaj (it also comprises the plain area of the Satu Mare County), project in which I have been participating since 2010.

The vegetal associations in the accumulation lakes area and in their vicinity are presented further as tables, comprising: codifying according to Doniță (2005) of the specific habitats, characteristic species and lakes where the association was identified. The number of identified vegetal associations is of 26 for the studied

lakes, ranging from one lake to another up to at most 13 associations, such as it is for the lakes Călinești and Vârșolț.

METHODOLOGY AND METHODS

The Studied Area

The specialised literature we studied provides us with data on the location of the artificial lakes in the following papers: Ujvari (1972), „Geografia apelor României” – *Geography of Romanian Waters*, Scientific Publishing House, Bucharest; Bogdan and Călinescu (1976), „Județul Satu Mare” *Satu Mare County*, The Academy Publishing House, Bucharest; Roșu and Domșa (2014), „Sinteza anuală privind calitatea corpurilor de apă în Spațiul hidrografic Someș - Tisa pe 2014” – *Annual Synthesis on the Quality of the Water Structures in the Hydrographic Area of Somes –Tisa for 2014*, the Someș – Tisa Water Basins Administration. F – Ga – 30.

The map in figure 1 shows the location of the most important lakes in the valleys of the main rivers in the area and of their tributaries.

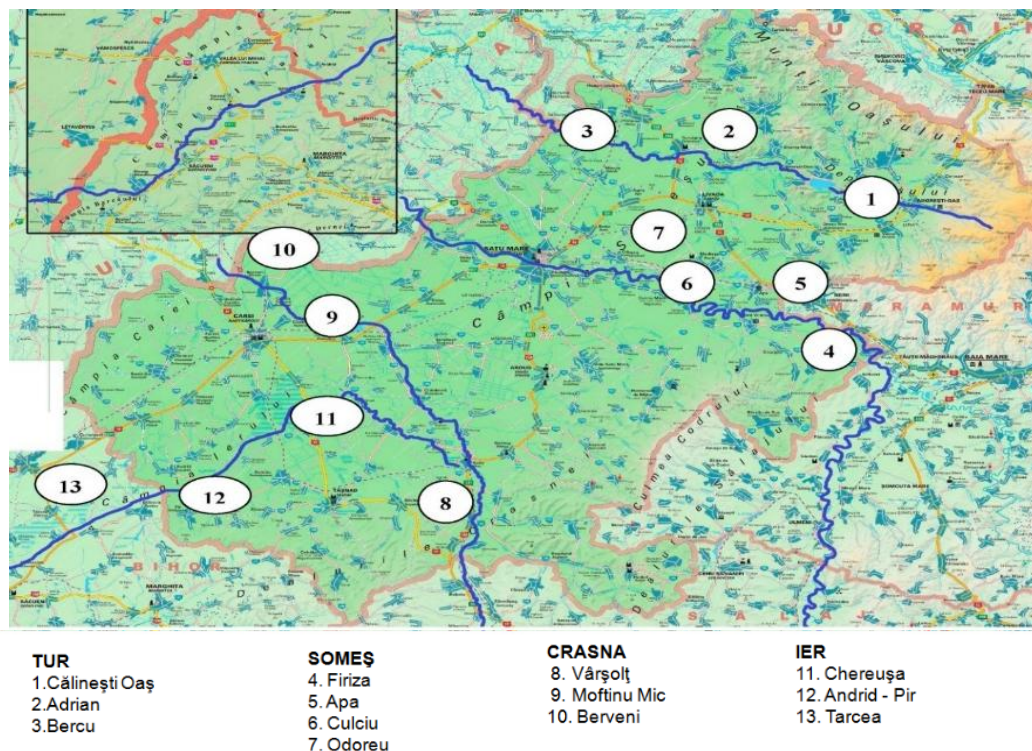


Fig. 1. Distribution of the main accumulation lakes in North-West Romania

MATERIALS AND METHODS

Methodologies

- a) *Methodology of research of the natural framework and communities in wetlands:* Gomoiu et al., 2009; Béres, 1984 and 1990.
- b) *Methodology of the study on biodiversity preservation in the accumulation lakes:* Ardelean and Ardelean, 2010; Tatole and Bănărescu, 1992.
- c) *Methodology of the botany study of the accumulation lakes:* Tucker and Evans, 1997; Karácsonyi, 1980; Ivan (coord.), 1992.

Methods

Study on the flora and vegetation in the area under study

The study on the flora and vegetation of the accumulation lakes and of the neighbouring areas was carried out in order to know the existing vegetal potential that represents the basis for the lake provided habitats, food sources, sheltering places, and the conditions for birds reproduction.

The stages of the study on the flora and vegetation for the four lakes under observation

- 1. Observations and sampling of biologic material

- 2. Identification of the observed or gathered plants species in the lake area
- 3. Carrying out surveys
- 4. Setting the vegetal associations with a role in the fauna, and particularly for the bird's populations

The study methods relied on the criteria issued by *Braun-Blanquet* (1964), also considering the particularities of the Romanian vegetation (*Borza and Boșcaiu*, 1965).

When studying the vegetation, the data were acquired by the survey method, carried out generally during the optimal time for the vegetation.

The size of the sampling areas was established according to *Cristea et al.*, 2004 namely: for the forests in general, 400m², for the meadows and segetal groups – 20-100m², and for the marshes 25m² (or less).

Relevance of phyto-coenosis surveys to each plant association was established with the help of recognition species, differential species as well as edifying species.

The cenotaxonomy classification of the identified associations was carried out according to the Romanian works by: *Coldea et al.* (1997), *Doniță et al.* (2005), *Ivan* (1992), *Sanda et al.* (1980, 2006, 2007, 2008).

RESULTS AND DISCUSSIONS

Table 1.

The Vegetal Associations Identified in the Aquatic Ecosystems of Adrian, Vârșoț and Călinești Oaş

No.	Association	Code of the corresponding habitat	Coeno-systematic category (class)	Localities	Characteristic species	Comments
1.	<i>Lemnetum minoris</i>	R 2202	<i>Lemnetea</i>	Adrian, Vârșoț	<i>Lemna minor</i> (dom.), <i>Lemna trisulca</i> ,	

No.	Association	Code of the corresponding habitat	Coeno-systematic category (class)	Localities	Characteristic species	Comments
					<i>Potamogeton natans</i> , <i>Potamogeton crispus</i> , <i>Spirodela polyrrhiza</i> , <i>Alisma plantago-aquatica</i> , <i>Ceratophyllum demersum</i> , <i>Lysimachia vulgaris</i> , <i>Ricciocarpus natans</i>	
2.	<i>Marsileatum quadrifoliae</i>	R 2203	<i>Lemnetea</i>	Călinești Oaș	<i>Marsilea quadrifolia</i> (dom.), <i>Lemna minor</i> , <i>Hydrocharis morsur-ranae</i> , <i>Potamogeton natans</i> , <i>Nuphar lutea</i> , <i>Trapa natans</i> , <i>Butomus umbellatus</i> , <i>Lemna trisulca</i>	
3.	<i>Ceratophylletum demersi</i>	R 2206	<i>Lemnetea</i>	Călinești Oaș, Adrian	<i>Ceratophyllum demersum</i> (dom.), <i>Lemna minor</i> , <i>Lemna trisulca</i> , <i>Potamogeton natans</i> , <i>Glyceria maxima</i> , <i>Utricularia vulgaris</i> , <i>Potamogeton crispus</i> , <i>Eleocharis palustris</i>	
4.	<i>Potametum natantis</i>	R 2207	<i>Potametea</i>	Adrian, Vârșoț	<i>Potamogeton natans</i> (dom.), <i>Ranunculus aquatilis</i> , <i>Lemna minor</i> , <i>Typha latifolia</i> , <i>Iris pseudacorus</i> , <i>Galium palustre</i> , <i>Ceratophyllum demersum</i> , <i>Potamogeton crispus</i> , <i>Polygonum amphibium</i> f. <i>aquaticum</i> , <i>Ranunculus sceleratus</i> , <i>Alisma plantago-aquatica</i>	
5.	<i>Scirpo – Phragmitetum</i>	R 5309	<i>Phragmitatea</i>	Vârșoț	<i>Phragmites australis</i> (dom.), <i>Typha latifolia</i> , <i>Glyceria maxima</i> , <i>Rorippa austriaca</i> , <i>Echinocystis lobata</i> , <i>Schoenoplectus lacustris</i> , <i>Urtica dioica</i> , <i>Lycopus europaeus</i> , <i>Lythrum salicaria</i> , <i>Symphytum officinale</i> , <i>Lysimachia nummularia</i>	Occasionally rendered eutrophic
6.	<i>Typhaetum latifoliae</i>	R 5305	<i>Phragmitetea</i>	Călinești Oaș, Vârșoț	<i>Typha latifolia</i> (dom.), <i>Alopecurus aequalis</i> , <i>Juncus effusus</i> , <i>Ranunculus repens</i> , <i>Rorippa sylvestris</i> , <i>Typhoides arundinacea</i> , <i>Carex gracilis</i> , <i>Galium palustre</i> , <i>Schoenoplectus lacustris</i> , <i>Myosotis scorpioides</i> , <i>Glyceria maxima</i>	

No.	Association	Code of the corresponding habitat	Coeno-systematic category (class)	Localities	Characteristic species	Comments
7.	<i>Typhaetum angustifoliae</i>	R 5305	<i>Phragmitetea</i>	Călinești Oaș, Adrian, Vârșoț	<i>Typha angustifolia</i> (dom.), <i>Galium palustre</i> , <i>Iris pseudacorus</i> , <i>Glyceria fluitans</i> , <i>Juncus effusus</i> , <i>Butomus umbellatus</i> , <i>Lysimachia vulgaris</i> , <i>Epilobium hirsutum</i> , <i>Carex acutiformis</i> , <i>Carex versicaria</i>	Rendered eutrophic at Adrian
8.	<i>Glycerietum maximae</i>	R 5307	<i>Phragmitetea</i>	Adrian	<i>Glyceria maxima</i> (dom.), <i>Lythrum salicaria</i> , <i>Stachys palustris</i> , <i>Juncus effusus</i> , <i>Sparganium erectum</i> subsp. <i>neglectum</i> , <i>Alisma plantago-aquatica</i> , <i>Iris pseudacorus</i> , <i>Bidens tripartita</i> , <i>Galego officinalis</i> , <i>Xanthium italicum</i>	High level of eutrophication
9.	<i>Eleocharidetum palustris</i>	R 5203	<i>Phragmitetea</i>	Vârșoț	<i>Eleocharis palustris</i> (dom.), <i>Alisma lanceolatum</i> , <i>Carex vulpina</i> , <i>Rorippa sylvestris</i> , <i>Potentilla reptans</i> , <i>Symphytum officinale</i> , <i>Carex acutiformis</i> , <i>Mentha aquatica</i> , <i>Rorippa amphibia</i> , <i>Equisetum palustre</i>	
10.	<i>Glycerietum plicatae</i>	R 5301	<i>Phragmitetea</i>	Vârșoț	<i>Glyceria plicata</i> (dom.), <i>Lycopus europaeus</i> , <i>Lythrum salicaria</i> , <i>Mentha aquatica</i> , <i>Typha angustifolia</i> , <i>Epilobium hirsutum</i> , <i>Sparganium erectum</i> subsp. <i>neglectum</i> , <i>Calystegia sepium</i> , <i>Lysimachia vulgaris</i>	
11.	<i>Caricetum acutiformis</i>	R 5310	<i>Phragmitetea</i>	Vârșoț	<i>Caricetum acutiformis</i> (dom.), <i>Carex vulpina</i> , <i>Lychnis flos-cuculi</i> , <i>Althaea officinalis</i> , <i>Potentilla erecta</i> , <i>Vicia cracca</i> , <i>Symphytum officinale</i> , <i>Poa palustris</i> , <i>Oenanthe aquatica</i> , <i>Phragmites australis</i>	
12.	<i>Caricetum gracilis</i>	R 5310	<i>Phragmitetea</i>	Vârșoț	<i>Carex gracilis</i> (dom.), <i>Galium palustre</i> , <i>Cirsium canum</i> , <i>Scutellaria galericulate</i> , <i>Lychnis flos-cuculi</i> , <i>Lythrum salicaria</i> , <i>Iris pseudacorus</i> , <i>Epilobium hirsutum</i> , <i>Carex vulpina</i> ,	

No.	Association	Code of the corresponding habitat	Coeno-systematic category (class)	Localities	Characteristic species	Comments
					<i>Eleocharis palustris</i> , <i>Carex riparia</i>	
13.	<i>Caricetum versicariae</i>	R 5310	<i>Phragmitetea</i>	Călinești Oaș, Adrian	<i>Carex versicaria</i> (dom.), <i>Phragmites australis</i> , <i>Alisma plantago-aquatica</i> , <i>Carex vulpina</i> , <i>Galium palustre</i> , <i>Ranunculus repens</i> , <i>Lycopus europaeus</i> , <i>Mentha aquatica</i> , <i>Schoenoplectus lacustris</i> , <i>Carex acutiformis</i>	
14.	<i>Juncetum effusi</i>	R 3709	<i>Molinio-Arrhenatheretea</i>	Călinești Oaș, Vârșoț	<i>Juncus effusus</i> (dom.), <i>Oenanthe silaifolia</i> , <i>Carex hirta</i> , <i>Juncus tenuis</i> , <i>Bidens tripartita</i> , <i>Gratiola officinalis</i> , <i>Trifolium repens</i> , <i>Carex vulpina</i> , <i>Alopecurus pratensis</i> , <i>Rumex crispus</i>	
15.	<i>Agrostetum stoloniferae</i>	R 3715	<i>Molinio-Arrhenatheretea</i>	Călinești Oaș, Adrian	<i>Agrostis stolonifera</i> (dom.), <i>Rorippa sylvestris</i> , <i>Lysimachia nummularia</i> , <i>Poa trivialis</i> , <i>Potentilla reptans</i> , <i>Trifolium repens</i> , <i>Ranunculus acer</i> , <i>Polygonum persicaria</i> , <i>Alopecurus aequalis</i> , <i>Valeriana officinalis</i>	
16.	<i>Ranunculo repenti – Alopecuretum pratensis</i>	R 3716	<i>Molinio-Arrhenatheretea</i>	Adrian	<i>Alopecurus pratensis</i> (dom.), <i>Ranunculus repens</i> , <i>Trifolium campestre</i> , <i>Festuca arundinacea</i> , <i>Arrhenatherum elatius</i> , <i>Poa pratensis</i> , <i>Antoxanthum odoratum</i> , <i>Festuca pratensis</i> , <i>Lathyrus pratensis</i> , <i>Juncus atratus</i>	
17.	<i>Arrhenatheretum elatioris</i>	R 3802	<i>Molinio-Arrhenatheretea</i>	Călinești Oaș	<i>Arrhenatherum elatius</i> (dom.), <i>Holchus lanatus</i> , <i>Potentilla anserina</i> , <i>Symphytum officinale</i> , <i>Bidens tripartita</i> , <i>Carex ovalis</i> , <i>Dactylis glomerata</i> , <i>Daucus carota</i> , <i>Leucanthemum vulgare</i> , <i>Lolium perenne</i> , <i>Lotus corniculatus</i>	In the lake
18.	<i>Festuco rubrae – Agrostetum capillaris</i>	R 3803	<i>Molinio-Arrhenatheretea</i>	Călinești Oaș	<i>Agrostis capillaris</i> (codom.), <i>Festuca rubra</i> (codom.), <i>Hellaria graminea</i> , <i>Galium mollugo</i> ,	On higher lands, on moist soil

No.	Association	Code of the corresponding habitat	Coeno-systematic category (class)	Localities	Characteristic species	Comments
					<i>Carex pallescens</i> , <i>Anthoxanthum odoratum</i> , <i>Poa pratensis</i> , <i>Luzula campestris</i> , <i>Cynosurus cristatus</i> , <i>Trifolium pratense</i>	
19.	Tanaceto – Artemisietum vulgaris	-	<i>Artemisietum vulgaris</i>	Vârșoț	<i>Tanacetum vulgare</i> (dom.), <i>Artemisia vulgaris</i> , <i>Cirsium arvense</i> , <i>Urtica dioica</i> , <i>Malva sylvestris</i> , <i>Rubus caesius</i> , <i>Galium aparine</i> , <i>Tussilago farfara</i> , <i>Humulus lupulus</i> , <i>Arctium lappa</i> , <i>Glechoma hederacea</i> , <i>Equisetum hederacea</i>	High ruderal vegetation, on the lake banks
20.	Salicetum triandrae	R 4416	<i>Salicetum purpureae</i>	Călinești Oaș,	<i>Salix triandra</i> (dom.), <i>Salix cinerea</i> , <i>Alnus glutinosa</i> , <i>Humulus lupulus</i> , <i>Salix viminalis</i> , <i>Helianthus tuberosus</i> , <i>Salix purpurea</i> , <i>Epilobium tetragonum</i> , <i>Vicia cracca</i> , <i>Urtica dioica</i> , <i>Echinocystitis lobata</i> , <i>Amorpha fruticosa</i> , <i>Sambucus nigra</i> , <i>Aristolochia clematitis</i>	
21.	Frangulo – Salicetum cinereae	R 4421	<i>Alnetea glutinosae</i>	Vârșoț	<i>Salix cinerea</i> (dom.), <i>Frangula alnus</i> , <i>Alnus glutinosa</i> , <i>Solanum dulcamara</i> , <i>Humulus lupulus</i> , <i>Rubus caesius</i> , <i>Calystegia sepium</i> , <i>Equisetum palustre</i> , <i>Symphytum officinale</i> , <i>Scirpus sylvaticus</i>	
22.	Fraxino danubialis – Ulmetum	R 4404	<i>Querco – Fagetea</i>	Adrian	<i>Fraxinus danubialis</i> (codom.), <i>Quercus robur</i> (codom.), <i>Ulmus minor</i> , <i>Malus sylvestris</i> , <i>Carpinus betulus</i> , <i>Anemone nemorosa</i> , <i>Carex sylvatica</i> , <i>Lapsana communis</i> , <i>Impatiens noli-tangere</i> , <i>Stachys sylvatica</i> , <i>Ranunculus auricomus</i> , <i>Carex acutiformis</i>	On moist soils, temporary flooded during springtime
23.	Carici brizoidis – Quercetum roboris	R 4145	<i>Querco – Fagetea</i>	Adrian	<i>Quercus robur</i> (dom. in trees layer), <i>Carex brizoides</i> (dom. in herbage layer), <i>Rhamnus cathartica</i> , <i>Viburnum opulus</i> , <i>Carex riparia</i> , <i>Oenanthe banatica</i> , <i>Rumex sanguineus</i> ,	In humid stations nearby the lakes, on pseudogley soils

No.	Association	Code of the corresponding habitat	Coeno-systematic category (class)	Localities	Characteristic species	Comments
					<i>Urtica dioica, Festuca gigantea, Lysimachia nummularia, Milium effusum, Geum urbanum, Ficaria verna</i>	
24.	Carpino – Fagetum	R 4119	<i>Quercus – Fagetea</i>	Călinești Oaș	<i>Carpinus betulus (codom.), Fagus sylvatica (codom.), Acer platanoides, Tilia cordata, Hedera helix, Aposeris foetida, Asarum europaeum, Euphorbia amygdaloides, Galium odoratum, Dryopteris filix-mas, Sanicula europaea, Mercurialis perennis</i>	On the coasts by the lake banks. Northern exposure.
25.	Quercus petraeae – Carpinetum	R 4123	<i>Quercus – Fagetea</i>	Călinești Oaș	<i>Quercus petraea (codom.), Carpinus betulus (codom.), Prunus avium, Tilia cordata, Campanula trachelium, Anemone nemorosa, Ajuga reptans, Carex sylvatica, Polygonatum multiflorum, Stachys sylvatica, Aegopodium podagraria, Ficaria verna</i>	On the lake banks.
26.	Pruno spinosae – Crataegum	R 3122	<i>Prunetalia spinosae</i>	Adrian	<i>Prunus spinosa (dom.), Crataegus monogyna, Amorpha fruticosa, Enonymus europaeus, Rosa canina, Cornus sanguinea, Ligustrum vulgare, Rubus caesius, Agrimonia eupatoria, Elymus repens, Dipsacus laciniatus, Ficaria verna</i>	Extended shrubbery on lakes banks and between lakes

THE VEGETATION OF THE LAKE CĂLINEȘTI OAȘ

Aspects regarding the vegetation of the Lake Călinești Oaș

The lake habitats are presented in figure 24, it has an area of 394 ha at normal retention level.

The mass of the water. It is of 8.4 mil. m³ at normal retention level. The water depth is between 1.50 and 10.00 m; as average, it is 2.50 m upstream, and 3.50-5.00 m downstream.

The large area of the water surface of the lake at Călinești Oaș, as well as its location in the Oas Depression, sets the specific character of this biocoenosis. The fact that the lake is constantly supplied by the river Tur leads to it being enriched with oxygen. Thus, eutrophication has a low level. In the eastern part of the lake where the water depth is lower, the mud deposits are more accentuated. In this part, during the drier summers, the water retreats from significant areas, thus forming wide boggy grounds.



Fig. 2. Habitats inside and neighbouring the Lake Călinești Oaș

Note:

1. Vegetal communities with cane, cattails: R 2203 - as. *Marsileatum quadrifoliae* Burescu 2003
2. Vegetal communities with cane, cattails: R 2206 - as. *Ceratophylletum demersi* Hild 1956
3. Vegetal communities with cane, cattails: R 5305 - as. *Typhaetum angustifoliae* Pignatti 1953
4. Vegetal communities with cane, cattails: R 5305 - as. *Typhaetum latifoliae* Soó 1927
5. Vegetal communities with cane, cattails: R 5310 - as. *Caricetum versicariae* Br.-Bl. et Denis 1926
6. Meadows: R 3715 - as. *Agrostetum stolonifera* (Ujvárosi 1941) Burduja et al. 1956
7. Meadows: R 3802 - as. *Arrhenatheretum elatioris* Br.-Bl. et Scherrer 1925
8. Shrubbery: R 3709 - as. *Juncetum effusi* Soó (1937) 1939
9. Willow shrubbery: R 4416 - as. *Salicetum triandrae* Malcuit 1929
10. Meadows: R 3803 - as. *Festuco rubrae-Agrostetum capillaris* Horvath 1951
11. Beech, sessile oak and hornbeam forests: R 4123 – as. *Quercu petraea-Carpinetum* Soó et Pócs 1957
12. Beech, sessile oak and hornbeam forests: R 4119 – as. *Carpino-Fagetum* Paucă 1941

Distance between points:

6-9: 925 m	9-5: 1040 m	5-8: 720 m	8-4: 316 m	4-2: 411 m	8-6: 238 m
6-1: 505 m	1-3: 229 m	6-7: 189 m	7-10: 378 m	10-11: 822 m	11-12: 234 m
12-11: 1120 m					

The vegetation providing a natural aspect for the lake

For the time being, the lake has a modest vegetation girdle. Only at the “lake tail” and on the right bank (about 5% of the perimeter), the vegetation is represented mostly by grassy swamp vegetation.

- *Submerged and floating vegetation.* At the “lake tail”, the species of whorl-leaf watermilfoil (*Myriophyllum verticillatum*) and floating pondweed (*Potamogeton natans*) are developed submerged, but also floating vegetation, dominated by the yellow water-lily (*Nuphar lutea*). Still here, we can observe a large expansion of the species *Marsilea quadrifolia*.

- *The reed and cattail girdle.* On the right bank of the lake, in the middle area, there is a girdle of modest vegetation, about 3 ha, made of reed (*Phragmites australis*) and cattail (*Typha angustifolia*), and in the

parts with low water, the water caltrop (*Trapa natans*) and common water-crowfoot (*Ranunculus aquatilis*) appeared. This vegetation is shelter and nesting places for species of marsh harriers, plovers, reed warblers etc.

- *Trees and bushes on the bank.* Still, on the right bank, there is a line of poplars (*Populus tremula*), a grove of 0.50ha of alders (*Alnus glutinosa*) and a shrubbery of poplars and willows (3 ha), where several species of raptors and crows are nesting.

The Vegetation Of Lake Adrian

It comprises several basins arranged for traditional and intensive breeding of carp and pike-perch, summing up 180 ha of water surface. It is in ROSCI 0214 – Tur and ROSPA 0068 – Tur low floodplain.



Fig. 3. Habitats inside and neighbouring the fish complex of Adrian

Note:

1. Vegetal communities with cane, cattails: R 2202 - as. *Lemnetum minoris* Oberdorfer ex Müller et Görs 1969
2. Vegetal communities with cane, cattails: R 2206 - as. *Ceratophylletum demersi* Hild 1956
3. Vegetal communities with cane, cattails: R 2207 - as. *Potametum natantis* Soó 1927
4. Vegetal communities with cane, cattails: R 5305 – as. *Typhaetum angustifoliae* Pignatti 1953 și *Typhaetum latifoliae* Lang 1973

5. Vegetal communities with cane, cattails: R 5307 – as. *Glycerietum maximae* Hueck 1937

6. Meadows: R 3715 - as. *Agrostetum stoloniferae* (Ujvárosi 1941) Buruja et al. 1956

7. Meadows: R 3716 - as. *Ranunculo repenti-Alopecuretum pratensis* Ellmaier 1933

8. Shrubbery: R 3122 - as. *Pruno spinosae-Crataegetum* Soó (1927) 1931

9. Ash-tree forest: R 4404 - as. *Fraxino danubialis-Ulmetum* Sanda et Popescu 1999

10. Oak forest: R 4145 - as. *Carici brizoidis-Quercetum roboris* Rațiu et al. 1977

Distance between points:

8-6: 1480 m	6-9: 839 m	9-7: 708 m	7-1: 339 m	1-5: 588 m	5-6: 490 m
6-2: 1010 m	2-4: 526 m	4-10: 477 m	10-8: 522 m	8-9: 221 m	9-3: 1732 m

The vegetation providing for a natural aspect to the lake

It is met in the basin 24 which presents itself as an artificial lake widely naturalised, placed in the flooded area of the Tur floodplain. Species of plants with high growth are present here, such as *Phragmites australis*, *Glyceria maxima*, *Thypha latifolia* and *Schoenoplectus lacustris*, and on the banks, we meet sedges such as *Carex acutiformis*, *C. gracilis*, *C. vulpina*, *Galium palustre*, *Myosotis scorpioides*.

The lake provides fish for aquatic ichthyophagous birds and the shorebirds, and the vegetation provides for many sheltering and nesting places.

The Vegetation Of Lake Vârșoț

It is a lake the main function of which is to supply the population with drinkable water, with a total area of 625 ha. It presents itself as a complex aquatic ecosystem. The habitats inside it are presented in figure 26.

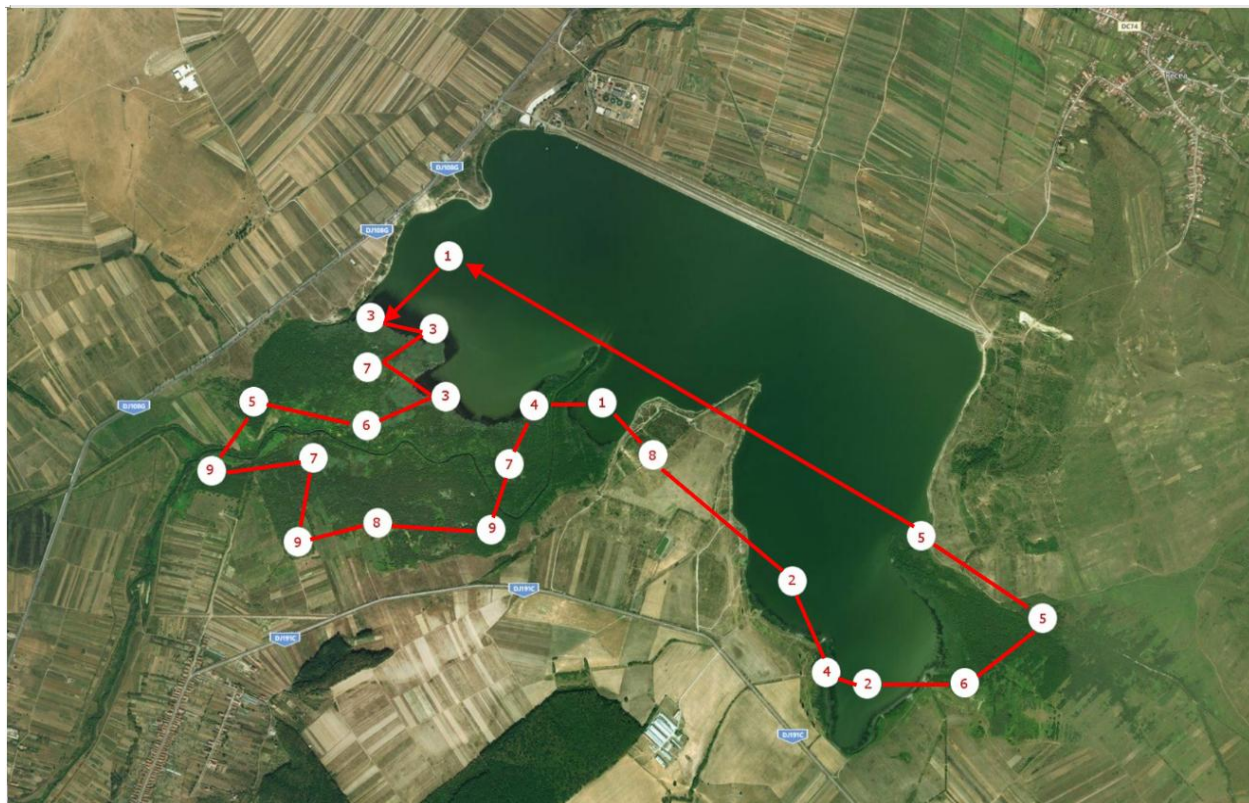


Fig. 4. Habitats of the Lake Vârșoț

Note:

1. Vegetal communities with cane, cattails: R 2202 – as. *Lemnetum minoris* Oberdorfer ex Th. Müller et Görs 1960
2. Vegetal communities with cane, cattails: R 2207 - as. *Potametum natantis* Soó (1977) 1934
3. Vegetal communities with cane, cattails: R 5309 – as. *Scirpo-Phragmitetum* W. Koch 1926
4. Vegetal communities with cane, cattails: R 5305 – as. *Typhaetum latifoliae* G. Lang 1973
5. Vegetal communities with cane, cattails: R 5301 – as. *Glycerietum plicatae* (Kulczynski 1928) Oberdorfer 1952
6. Vegetal communities with cane, cattails: R 5310 – as. *Caricetum acutiformis* Egger 1933 și *Caricetum gracilis* Almquist 1929; R 5203 - as. *Eleocharitetum palustris* Schennikov 1919
7. Shrubbery: R 3709 - as. *Juncetum effusi* Soó (1931) 1939
8. Habitat with ruderal vegetation represented by as. *Tanaceto-Artemisetum vulgaris*
9. Buckthorns and grey willows shrubbery: R 4421 - as. *Frangulo-Salicetum cinereae* Graebner et Hueck 1931

Distance between points:

1-3: 535 m	3-3: 270 m	3-7: 295 m	7-3: 324 m	3-6: 260 m	6-5: 510 m
5-9: 423 m	9-7: 455 m	7-9: 472 m	9-8: 313 m	8-9: 535 m	9-7: 343 m
7-4: 348 m	4-1: 254 m	1-8: 354 m	8-2: 923 m	2-4: 388 m	4-2: 234 m
2-6: 640 m	6-5: 725 m	5-5: 861 m	5-1: 2550 m		

The vegetation providing for a natural aspect of the lake

Having a clogging level of about 15%, in some areas of the lake (tail and gulf), several naturalizing species settled down.

- *Marsh plants from the "lake tail"*. Most of this area, with water lower than 1.50 m, created a special habitat consisting of island of cattail (*Thypha latifolia*). The habitat draws in several types of shorebirds: *Fulica atra*, *Pluvialis apricarius*, *Vanellus vanellus*, *Tringa ochropus*, *Himantopus himantopus*, *Calidris alpina*, *Charadrius dubius*, *Actitis hypoleucos*, *Tringa totanus*, etc.

- *The gulf with aquatic wood vegetation*. On the left side of the lake, there is a gulf of about 35 - 40ha, with low water, below 2.00 m, mostly in eutrophication, where trees of 3 - 6 m in height grow, mostly from the species of *Salix alba* and *Populus tremula*, which form

shelter, feeding and nesting places for many aquatic or even raptor birds.

CONCLUSIONS

The vegetal layer in the area of the accumulation lakes of the North-West Romania consists in numerous primary and secondary vegetal associations. In general, their composition is quite unitary, given that all these lakes are located at relatively lower altitudes. More diverse is the structure of the vegetal layer in the area of the Lake Călinești Oaș, located in the Oaș Depression, while, in the area of the Lake Vârșoț, there are some floral elements typical for the territory of Salaj County.

As for the eutrophication of the lake's water, the situation varies from one lake to another. This phenomenon is relatively reduced for the three lakes under study, though there are areas with high eutrophication.

We describe 26 vegetal associations covering the lakes waters, their banks, and neighbouring habitats. We also included some data on the coenosis in the neighbouring areas with drier soil which are of particular importance in the life of the birds belonging to these artificial ecosystems.

AUTHORS CONTRIBUTIONS

Conceptualization, Duță. C. S. and Hermenean A.; methodology, Duță C. S.; Hermenean A., Ardelean A.; data collection Duță C. S.; Ardelean D. P., Turcuș V.; data validation, Duță C. S.; Ardelean D. P., Turcuș V.; data processing Duță C. S.; Ardelean D. P., Turcuș V.; writing— original draft preparation, Duță C. S. and Turcuș V.; writing—review and editing, Hermenean A.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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