

1. Date this sheet was completed/updated 1/6/1998

2. Country: Greece

3. Name of wetland: Lakes Volvi and Koronia

4. Geographical coordinates: lon: 23⁰ 20' lat: 40⁰ 41'

5. Altitude (average and/or max. & min.): 119 m

6. Area (in hectares): 16,388

7. Overview (general summary, in two or three sentences, of the wetland's principal characteristics):

The two freshwater lakes Volvi and Koronia are connected with a narrow strip of land by an open channel. The lakes are fringed with reed-beds (*Phragmites communis*) and patchy riverine woodland. The strip of land between the lakes supports mature plane trees which are used by nesting heron colonies.

8. Wetland type (please circle the applicable codes for wetland types as listed in Annex I of the Explanatory Note and Guidelines document):

marine-coastal: A · B · C · D · E · F · G · H · J · K

inland: L · M · N · Q · P · Q · R · Sp · Ss · Tp

Ts · U · Va · Vt · W · Xf · Xp · Y · Zg · Zk

man-made: 1 · 2 · 3 · 4 · 5 · 6 · 7 · 8 · 9

Please now rank these wetland types by listing them from the most to the least dominant: O, Xf, Ts, 3, 9,

9. Ramsar Criteria: (please circle the applicable criteria; see point 12, next page)

1a · 1b · 1c · 1d | 2a · 2b · 2c · 2d | 3a · 3b · 3c | 4a · 4b

Please specify the most significant criterion applicable to the site: 3

10. Map of site included? Please tick yes or no

(Please refer to the Explanatory Note and Guidelines document for information regarding desirable map traits)

11. Name and address of the compiler of this form:

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12. Justification of the criteria selected under point 9, on previous page

Criterion 1: see Sections 14 and 16

Criterion 2: see Section 17 and 18

Criterion 3: see Section 18

Criterion 4: see Section 18

13. General location: Lake Koronia and Lake Volvi are situated in Northern Greece, at the central part of Makedonia (Macedonia), , 30-50 km far from Thessaloniki (750,000 people) which is the second largest city of Greece. Langadas town of 6,095 inhabitants is located at the north-west edge of Lake Koronia and it is the local administrative centre (District level). Lake Volvi is located at 11,5 km to the east of Lake Koronia.

14. Physical features:

Geology and geomorphology: Both lakes are situated in the Mygdonian basin, which has a west-east orientation with a natural exit to the sea (Strymonikos Gulf) by Rihios river, running through Redina gorge. The two lakes now occupy the deepest parts of the former Mygdonian Lake, which covered the basin a few million years ago. Several petrographic formations contribute to the geology of the area, such as gneiss, granites, phyllites, amphibolites and very sparsely, limestone.

Origins: It is a natural ecosystem modified by human interventions.

Hydrology: Many intermediate torrents flow into the lakes and Richios river is the natural exit to the sea of Lake Volvi, with a constant flow of 0.2-0.3 m³/sec. This discharge volume is much lower than that of the previous decade.

Soil type and chemistry: In the lowland coastal zone the soils are alluvial, fine-grained, with high nutrient concentration, considerable depth and high fertility and soil pH between 8.5-9.0. The brown forest and the acid brown forest soils predominate in the wider area.

Water quality (physico-chemical characteristics): Lake Koronia is nutrient-rich and murky, freezing for several weeks in the winter, with a shortage of oxygen during summer. Volvi is poorer in nutrients and clear, does not freeze in winter and is well oxygenated even in the hottest months. The pH of Lake Koronia is 0.65 and of Lake Volvi is 9.4.

Depth, fluctuations and permanence of water: Lake Koronia lies at 75 m above sea level, a little higher than Lake Volvi which lies at 37 m a.s.l. and the two lakes were connected through a natural channel. During the last 10 years the volume of Lake Koronia has decreased dramatically due to the decrease of the precipitation and to the over-consumption of the lake water. The low water level of Lake Koronia resulted to the interruption of this connection which was artificially restored by a channel, constructed in 1980. Lake Volvi has a natural exit to the sea by Richios river. Koronia is shallow (1-4 m at the shore, and up to 6 m at the centre) but Volvi is deeper (10-23.5 m).

Catchment area: Lake Koronia has a catchment area of 1,308 km² and Lake Volvi has a catchment area of 782,5 km².

Climate: It is mesothermic with a dry period during the hot summer, whereas at the nearby uplands, relatively harsher weather conditions predominate. The air temperature fluctuates,

January being the coldest month (mean temperature of 4⁰C) and July the warmest (mean temperature of 25,7⁰C). The mean seasonal temperature values are 5,7⁰C in winter, 13,7⁰C in spring, 24,4⁰C in summer, and 16,⁹⁰C in autumn. The mean air temperature is 14,9⁰C. The mean annual precipitation around the lake is approximately 415 mm. Winds of N, NW and NE direction predominate.

15. Hydrological value:

The primary hydrological values are water storage, enrichment of the aquifer.

16. Ecological features:

The lakes and their wider area present a high biological diversity at the species and habitat levels. On the hills south of Lake Volvi there is hard - leafed Mediterranean maquis followed by remnants of the ancient lakeside riparian forest of Apollonia (30 hectares), on the estuary of Melissourgos torrent Main tree species are *Alnus glutinosa*, *Platanus orientalis* and *Populus alba*, while *Salix alba* and *fragilis*, *Populus nigra*, *Ficus carica*, *Pyrus amygdaliformis*, *Juglans regia*. The other riparian forest of Redina, is situated in the valley of Richios river. The dominant *Platanus orientalis* trees are accompanied by *Salix spp.*, *Fraxinus ornus*, *Cornus mas*, *Nerium oleander*, *Vitex agnus*, *V. castus* etc. Particularly valuable are the shallow waters with high primary productivity (which host an impressive number of aquatic plant species), and the reed-beds. At the edge of the lakes, large areas are covered by submerged aquatic vegetation and reeds, where a large number of fish species feed. The next outer zone includes semi-aquatic plant species (particularly at the eastern and western sides of lake Koronia). The outermost perimeter of this zone is the limit of the wetland that is surrounded by man-made habitats, particularly by cropland.

The vegetation in the valley ranges from the beech zone on the mountain tops down to the zone of oak and chestnut.

17. Noteworthy flora:

Aquatic, marsh, and riparian plant species are the main representative of the site's flora. 336 plant species consist the flora of the area, 33 of which are considered as rare (*Alisma gramineum*, *Arundo donax*, *Juncus compressus*, *Najas minor*, *Ruppia maritima*, *Lycium europaeum*, *Sparganium erectum ssp. erectum*, *Rumex palustris*, *Lysimachia vulgaris*, *Samolus valerandi*, *Salix cinerea*, *Gratiola officinalis*, *Berula ereota*). In the last 30 years, 14 species have disappeared from Lake Koronia (including all the benthophytes) and 2 from Lake Volvi, while 10 species in Volvi are endangered (*Butomus umbellatus*, *Vallisneria spiralis*, *Potamogeton rodosus*, *P. perfoliatus*, *Nymphaea alba*, *Hydrocharis morsus-ranae*, *Ceratophyllum submersum*, *Trapa natans*, *Azolla filiculoides*, *Salvinia natans*, *Ricciocarpos natans*). *Najas minor*, *Ricciocarpos natans*, and *Potamogeton obtusifolius* are new species for the Greek flora, and *Salvinia natans*, *Salix viminalis*, and *Trapa natans*, are protected by national Presidential degree. *Myriophyllum spicatum*, *Ceratophyllum demersum*, and *C. submersum* provide valuable habitats for fish species. Locally extensive reed beds of *Scirpus maritimus* and *Phragmites australis* occur around the lakes and along the river banks. Two perennial Plane trees, with important bird colonies, are found between the two lakes.

18. Noteworthy fauna:

At least 5 amphibian species have been recorded (of which *Bufo viridis*, *Hyla arborea*, and *Rana balcanica* are protected by international Conventions), 14 reptiles (of which *Testudo graeca* is included in Annex II of Council Directive 92/43/EEC, and the *Agama stellio*, *Lacerta trilineata*, *Lacerta viridis*, and *Natrix tessellata* are protected by international Conventions) and 34 mammals (of which *Myotis blythi*, *Myotis bechsteinii*, *Lutra Lutra* are included in Annex II of Council Directive 92/43/EEC, and *Canis lupus*, *Pipistrellus kuhli* and *P. nathusii* are included in the National Red Data Book) but no detailed studies exist about these classes of animals. One of the most endangered mammal species occurring in the past was the Otter (*Lutra lutra*) but now there is no evidence of its presence. European souslike (*Spermophilus citellus*) as well as several bat species also exist. Among the 29 fishes that have been recorded, two of them are endemic, (*Alosa macedonica* and *Chalcalburnus chalcoides macedonicus* which could be classified as vulnerable), two are included in the National Red Data Book (*Leuciscus cephalus macedonicus* and *Vimba melanops*), and 6 are included in Annex II of Council Directive 92/43/EEC (*Alosa alosa*, *Aspius aspius* - very rare species, *Rhodeus sericeus amarus*, *Barbus plebejus*, *Chalcalburnus chalcoides*, and *Cobitis taenia*.). Three invertebrates included in Annex II of Council Directive 92/43/EEC. have been recoded *Unio crassus bruguerianus*, *Lindenia tetraphylla*, and *Lycaena dispar*.

The area has always been important bird species, but it became even more important as a bird habitat after 1957 when the two small lakes of Mavrouda and Lantza to the north of Volvi were drained. Today approximately 200 bird species have been observed from which at least 40 breed in the area and 62 are listed under Annex I of the Wild Bird Directive (79/409). Many species of birds nest around the two lakes, like *Ardea Cinerea* (forms two colonies of approximately 70-80 nests, in two huge perennial Plane trees), *Nycticorax nycticorax*, *Ardea purpurea*, *Ixobrychus minutus*, *Egretta garzetta*, *Ciconia ciconia* (whose breeding population in the area is among the greatest in Greece), *Tadorna ferruginea*, *Accipiter brevipes*, *Buteo rufinus*, *Aquila pomarina*, *Circus aeruginosus*, *Hieraaetus pennatus*, *Coracias garrulus*. Lake Koronia is one of the most important wintering sites for waterfowl in Greece. Some important wintering waterfowl species are *Aythya ferina* with a mean number of 1352 individuals in the last twelve years, *Tadorna tadorna* and also *Anas platyrynchos* and *Fulica atra*. Other wintering species are *Podiceps cristatus* with a mean number of 1924 individuals in the last twelve years, *Phalacrocorax pygmeus*, a world-wide threatened species, and *Egretta alba*. The most impressive migratory bird is *Pelecanus crispus*, that is threatened world-wide. In recent years small populations of *Phoenicopterus ruber* (10-50) appear frequently at lake Koronia resting or feeding during their migration. Nearby, Lake Volvi is too deep for many birds, but the Apollonia forest hosts both *Ciconia ciconia* and *C. nigra* and at Redina Gorge, to the east, one may observe *Ciracaetus gallicus*, *Aquila Chrysaetos*, *Bubo bubo* and perhaps *Neophron percnopterus*.

19. Social and cultural values: (e.g. fisheries production, forestry, religious importance, archaeological site etc.)

Even though very important in past decades, today the commercial value of the fish production is low. In general the income from fishing is constituting only a supplementary source of living for locals. The main values of the wetland areas is their use for agriculture (farming and cattle raising)

The site has significant archaeological importance. It was crossed by the Ancient Roman road called Via Egnatia, along the southern coast of both lakes. There are remnants from the Byzantine period like the well preserved castle of Redina and the tower at Agios

Vasilios village. In the village of Apollonia, there is a tree under which, according to a local tradition, St. Paul the Apostle has preached in his first visit to Europe.

Since the target-oriented awareness project was carried out, in 1994-95, in the frame of MedWet, an increased social value of the wetland itself was noted amongst local users and authorities. However, due to its numerous management problems, the site has not yet developed a strong trend for eco-tourism, environmental education and bird watching. Moreover the area is of great scientific value in the fields of biology, ecology, hydrology and geology.

20. Land tenure/ownership of:

(a) site: The lakes are State property

(b) surrounding area: It consists of private cultivated land and of land of public use (roads, canals, arid land).

21. Current land use:

Site: Both lakes are primarily used for irrigation water supply, as around them there are irrigated cultivations (mainly vegetables and maize).

As grazing fields of the wider area have been seriously degraded. during the last years, the areas around the lakes are more intensively grazed. Around Lake Koronia grazing occurs intensively, while around Lake Volvi grazing fields are under less pressure.

Net fishing activities occur during the whole year except for the fish spawning period.

Surroundings/catchment: Within the catchment area, about 83,215 people live mostly in 70 small communities. The 90% of the lowland is cultivated mainly with cereals, maize, tomato, tobacco etc. And irrigated crops such as maize and alfalfa are extending in space. Other current land uses are forestry, grazing and manufacturing, which has become increasingly important in the western part of the region, near the town of Langadas, thus adding another source of income.

22. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land use and development projects:

Water quality in Lake Koronia had been gradually degrading by the development of manufacturing units and the lack of sewage treatment units in the catchment area. Agricultural run-off and discharge of effluents from the numerous animal breeding farms and industrial units of the area has been considered high, especially to Lake Koronia. It is estimated that around this lake, the agro-chemicals used exceed the needed amounts at about 20%. Environmental authorities had imposed environmental conditions in the operation of the manufacturing units and controls for the implementation of environmental conditions have been increasingly performed.

Water quantity issues have been related to the lowering of the water level, due to serious droughts during the last period and the greatly increased water uptake by direct pumping or drillings, from the surrounding agricultural land and industrial activities.

The decrease in water level has a further intensifying effect on pollution and eutrophication. These two problems combined, resulted in a case of mass fish mortality (August 1995) in Lake Koronia, caused mainly by the high concentrations of industrial and domestic effluents. A month later, death of many birds, especially ducks followed. The following year, an attempt of reintroducing fish species remained unsuccessful and in May 1997,

another incident of mass fish mortality occurred. Measures taken to remedy this situation included the prohibition of drilling water from the aquifer, however water levels are still low and the population of birds and especially ducks, feeding on fish, is declining.

Due to the above mentioned hydrological changes, certain fish species were eliminated from Lake Koronia, the most economically important ones being the Eel and the Common Bream. Moreover, because of the water retreat, valuable spawning sites for fish and bird habitats are at the moment lost.

The exposure of large areas of the bottom of the lakes to the surface resulted to unauthorised attempts to cultivate them. Legal measures against such actions were taken by the relevant authorities.

Lake Volvi on the other hand, even though exposed to a certain degree to similar threats is in a more natural state .

The riparian forest of Apollonia was under pressure for poplar plantations and unauthorised felling. At the riparian forest of Rendina, pressures included land reclamation for agriculture and tourist development. These pressures have been gradually removed since 1990, when a procedure for approval of Environmental Terms for a number of works and activities through Environmental Impact Assessments/ Studies has been established in Greece. Aiming to holding back the further loss and degradation of the site, all relevant projects have since been examined under this procedure by the Environmental Authorities. The majority of projects concerning animal farms, drainage and/or agricultural improvement was rejected whereas only the absolutely necessary and less disturbing ones have been permitted.

Remaining pressures to be dealt with the new Management Plan include improper waste disposal, grazing and sand extraction. Two projects in the wider area of the site that might have negative impacts on it are the construction of the Egnatia Highway and the construction of a Sanitary Landfill for the solid wastes of the city of Thessaloniki which are to be examined on the basis of the impacts that it may have on the ecosystem.

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23. Conservation measures taken: (national category and legal status of protected areas - including any boundary changes which have been made: management practices: whether an officially approved management plan exists and whether it has been implemented)

The Ramsar site as shown on the map provided to the Ramsar Bureau (see 24. zones A and B below) has been proposed for inclusion in the NATURA 2000 network under the codes GR1220001 and GR1220003. Part of this area is already an SPA under the code GR1220009.

A Joint Ministerial Decision with zone delimitation and protection - management measures is now signed by most of the involved Ministers and is expected to be published in the official Government Gazette soon.

A Preliminary Management Scheme has been operating first through the MedWet awareness project (1994-95) co-ordinated by the Ministry of Environment. In 1997, this Scheme was officially established by Programme Agreement signed by the Ministers of Environment and Agriculture, the Regional Environmental Services and Local Authorities. It comprises a Joint Committee for the steering of the implementation, it has a flexible administration and the required secretariat /co-ordination support is provided by a Local Development Institution named "Thessaloniki Development Co". The Programme Agreement has an Annex with the planned works and activities, their time-table (1997-1999) and budget. Priority actions include the operation of an Information Centre, visitor management and interpretation (placement of signs, construction of warden houses, observation towers etc.), training of the personnel, management works of the riparian forests of Apollonia and Rendina, warding of the site.

Preliminary Management Schemes have a three fold aim: 1) to respond quicker to the matters that arise concerning the every day management problems of the sites, 2) to carry out projects concerning awareness, infrastructure, monitoring and management., and 3) to co-ordinate relevant authorities in working out the further priorities for the management of the sites.

The Ministry of the Environment in collaboration with the Ministry of National Economy has undertaken certain actions for the wise use of the water and the elimination of water pollution in the site. Moreover, various decisions at a prefecture level for the quality standards of the effluents entering the lake, the management of the exposed surfaces after the lowering of water level, the conservation of hydrology, regulation of grazing, inventory of the exposed areas and the imposition of fines and charges for law violations are being implemented.

Hunting is prohibited in the lakes and a buffer zone up to 200 m from the shore. A number of laws define the fishing regime and protect the riparian vegetation. Regular controls for the maintenance of environmental conditions are performed in the industries of the area. Prohibition for drilling within a zone of 500 m around the lakes is in force.

A project for upgrading the environmental quality of the torrents flowing in lake Koronia has been already financed and put in operation. Measures have been taken for the protection of the two riparian forests, Apollonia and Redina (fencing). The waste water treatment plant of Langadas city has been constructed and its operation is a positive step towards the improvement of water quality of Lake Koronia.

The two perennial Plane trees which are found between the two lakes and host Grey heron colonies, are declared Natural Monument. The fencing of these trees was successful especially regarding the Grey heron colonies. No interventions occur today and the pavilion attracts a lot of individuals and schools.

During the MEDWET-ACNAT project, a 16-month pilot sub-project on public awareness had been implemented at the site. The multiple objectives of this sub-project converged to

the enforcement of awareness and communication among the associated civil services, the Local Government, professional unions, co-operatives, NGOs, the general public and generally, everyone involved in the management and use of the wetland resource. The activities included the organisation of technical meetings, workshops, the publication of brochures and posters, etc.

Studies for the conservation of Lake Koronia, the ichthyofauna and delineation of fishing zones, and the eco-touristic development of the area have been prepared.

The site is included in the Montreux Record since 1990. Under the Management Guidance Procedure a mission that visited Greece in 1988 described the main problems of Lake Koronia..

24. Conservation measures proposed but not yet implemented: (e.g. management plan in preparation; officially proposed as a protected area etc.)

At the moment, a set of measures and delimitation of zones are forwarded through a Joint Ministerial Decision signed by most of the involved Ministries. The Joint Ministerial Decision delimitates three main zones:

Zone A includes the two lakes, marshes, torrents, the vegetation around the lakes, riparian forests and agricultural land. Core areas where the most sensitive bird habitat occur are defined within zone A where only scientific research is allowed.

In zone A, outside the core areas, permitted activities (under specific) are: scientific research; daily visits for observation of nature, environmental education (camping is prohibited); use and maintenance of roads (extension of the road system is not allowed and prohibition of access at some places can be regulated); works for the conservation, protection and rehabilitation of habitats; preservation of archaeological sites; grazing of sheep and cattle outside the marsh, the reed-beds and the riparian vegetation; fisheries outside the cores of protection; aqua-culture as it stands; harbouring and sailing of small boats; preservation, improvement or extension of the infrastructure concerning the above activities; mild water sport; agriculture and tree plantation as they are practised today; forestry; maintenance of drainage systems; disposal of waste water only after secondary treatment, removal of unauthorised constructions.

Zone A comprises the Ramsar site

Zone B includes a peripheral zone of the parts of the places belonging to zone A including forest areas, grassland and agricultural land.

In zone B, permitted activities (under specific terms) are: scientific research; visits for observation of nature, environmental education, camping and sport; works for the conservation, protection and rehabilitation of nature; preservation of archaeological sites; extensive grazing of sheep and cattle; agriculture and tree plantations at the already used areas; preservation of drainage systems (new land reclamations, drainage networks and irrigation works are prohibited); hunting according to the regulations; use of the road network (construction of roads leading to zone A is prohibited); construction of works for the improvement, restoration and conservation of various facilities; construction of green houses; apiculture; forestry; establishment of small units processing agricultural products; extension and modernisation of aqua-culture facilities; use of existing agricultural storage houses; building of one-level houses and small scale extension of existing communities.

In addition, a buffer zone is identified as Zone C of The wider / catchment area, which includes mainly agricultural land and grazing fields.

In this zone, permitted activities under terms are: establishment of nuclear industries or units of heavy industry; improper disposal of wastes; construction of places for sanitary landfill of big cities; large scale excavation works; establishment of new industrial units that dispose effluents to zone A; forestry that threatens the wetlands are prohibited.

All of the site is proposed for the category of National Wetland Park, according to the Law 1650/86 (legal text under preparation, in form of a Presidential Decree). The site is a game refuge.

Management proposals not yet officially approved have been elaborated for many aspects of the management of the site, as part of the documentation required for the establishment of the National Wetland Park, including the establishment of a permanent Management Scheme. The conservation projects are in accordance with the "Guidelines on Management Planning for Ramsar sites and other Wetlands" and include soil studies, projects for the decrease of agro-chemicals in agriculture, management of fisheries, improvement of the waste water treatment systems, mapping of the exposed areas after the retreat of the water.

A project of incentives for the voluntary implementation of management measures in agricultural land (using the agri-environmental regulation 2078/92) is under the process of approval. The project includes promotion of biological cultivation, reduction of grazing, long-term pause of cultivation and reduction of the amount of fertilisers used.

Works for the improvement and modernisation of the slaughter houses of the area and the management of the solid wastes are planned as well as the rehabilitation of the former Lake Mavrouda.

On-the ground delineation of the boundaries of Lake Koronia is planned by the regional authorities. A hydrological network in Mygdonia catchment area is going to be established for measuring qualitative and quantitative parameters.

25. Current scientific research and facilities: (e.g. details of current projects; existence of field station etc.)

Many research projects are carried out dealing with the water quality, fish and bird fauna, phytoplankton studies, heavy metals pollution, aquatic vegetation etc.

The Ministry of Macedonia and Thrace is performing a water quality monitoring project.

26. Current conservation education: (e.g. visitors centre, hides, information booklet, facilities for school visits etc.)

A fully equipped Information Centre is established at the site, together with constructions for bird watching, guardhouses etc. This infrastructure supports the activities of information - public awareness, environmental education and monitoring. Specific actions of information and public awareness include special publications, video tapes, CD Roms, organisation of workshops and guided tours of visitors and schools.

27. Current recreation and tourism: (state if wetland is used for recreation/tourism; indicate type and frequency/intensity)

The lakes are not primarily used for tourism or recreation. Once or twice a year there are water sports performed in parts of the lakes. The wider area is neighbouring to some developed areas for tourism on the eastern coastline and it is visited by people using the spring baths (SPA). About 1400 beds places were available to tourists in 1993, in the wider area, which was visited by about 5500 people. Eco-tourism is an interesting prospective for the area and a project for eco-touristic development through a local development programme has been proposed.

28. Jurisdiction: (territorial e.g. state/region and functional e.g. Dept of Agriculture/Dept. of Environment etc.)

Territorial jurisdiction over the site has the Region of Kentriki Makedonia. Concerning the functional (conservation) jurisdiction, co-ordination lies with the Ministry of Environment in collaboration with the Ministry of Agriculture, the Prefecture of Thessaloniki and Local Authorities.

29. Management authority: (name and address of local body directly responsible for managing the wetland)

No single body legally responsible for the direct local conservation of the wetland exists. The Preliminary Management Scheme is guided by a Joint Committee temporarily presided by a representative of the Ministry of Environment. In the near future it will be presided by a representative of the local authorities. Secretarial assistance is provided by :

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30. Bibliographical references: (scientific/technical only)

Economidis, P.S. 1991. Check list of freshwater fishes of Greece. Recent status of threats and protection. Hellenic Society for the Protection of Nature. Athens, Greece. 46 p.

Fytianos, K., V. Samanidou, and T. Agelidis. 1986. Comparative study of heavy metals pollution in various rivers and lakes of Northern Greece. *Ambio*. 15:42-44.

Grimmet, R.F.A. and T.A. Jones, (compilers). 1989. Important Bird areas in Europe. International Council of Bird Preservation (ICBP), Technical Publication No 9. International Waterfowl and Wetland Research Bureau (IWRB). 888 p.

Koutrakis E.T., and G.I. Blionis. 1995. Raising Public awareness and information with regard to Lakes Koronia and Volvi (Macedonia, Greece). *MedWet*. Greek Ministry of Environment & Physical Planning, and Public Works (Natural Environment Management Section. Greek Biotope/Wetland Centre. 78 p. (Gr, En).

Ministry of Environment, Physical Planning, and Public Works. 1986. Programme for the delineation of Ramsar wetlands: Wetlands Koronia & Volvi. Athens.

Ministry of Agriculture, II Regional Directorate of Land Reclamation. 1988.

Hydrobiological study of the Volvi watershed, Prefecture of Thessaloniki. Preliminary study. 36 p. (In Greek).

Ministry of the Environment, Planning and Public Works (YPEXODE). 1996. Specific Environmental Study (Programme for tackling specific environmental problems and the operation system of the protected area of Lake Volvi and Lake Koronia.) YPEXODE. Athens. Part I.

- Papastergiadou, Eva. 1990. Phytosociological and ecological studies of aquatic macrophytes (hydrophytes), in Northern Greece. Ph. D. Thesis, Scientific Annals of the Faculty of Natural Sciences, Aristotle University of Thessaloniki. (Gr, En su).
- Patsadelii, G., Portalios, I., and Voyiadzis, V. 1983. Development plan of areas adjacent to Koronia & Volvi. Thessaloniki. Unpublished report. 67 p.
- Pavlidis, G., V. Goutner, Marinela Zarftzian-Likaki, I. Diamantopoulos, Polyxeni Tzortzi, D. Kokkas, and C. Eminoglou. 1986. Delineation study of the Ramsar wetlands: Lake Volvi and Lake Lagada. Ministry of Environment, Physical Planning and Public Works. Athens. (In Greek).
- Vafiadis, P., G. Giouzevas, A. Zarkanelas, E. Kotleas, G. Papastathis, V. Sortikos, and A. Foutsis. 1990. Environmental impacts on the Lake Volvi due to the construction of irrigation works in the area of Askos and Volvi. Ministry of Agriculture, Directorate of Land Reclamation of the Prefecture of Thessaloniki. (In Greek).
- Voulgaropoulos, A., Fytianos, K., Apostolopoulou, A. and Gounaridou, X. 1987. Correlation of some organic pollution factors in water systems in Northern Greece. *Wat. Res.* 21 (3):253-256.
- Zalidis, G.C., and A.L. Mantzavelas. (eds). 1994. Inventory of Greek wetlands as natural resources. EKBY. 605 p.