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

2. Country: Greece

3. Name of wetland: Lake Vistonis, Porto Lagos, Lake Ismaris and adjoining Lagoons

4. Geographical coordinates:
   - Lake Vistonis and Porto Lagos: lon: 25° 11’ lat: 41° 03’
   - Lake Ismaris: lon: 25° 19’ lat: 40° 59’
   - Adjoining Lagoons: lon: 25° 13’ lat: 40° 56’

5. Altitude (average and/or max. & min.): 1.5 m

6. Area (in hectares): 24,396

7. Overview (general summary, in two or three sentences, of the wetland’s principal characteristics):
   It is a wetland complex, actually in continuation with Nestos Delta in the west. From west to east it comprises of a coastal lake (Vistonis), the Porto Lagos lagoon with mostly saline waters, six shallow saltwater lagoons (Xirolimni, Karatza, Messi, Ptelea, Elos, Limni) separated from the sea by a sandy beach, and a freshwater shallow lake (Ismaris) 3km far from the coast.

8. Wetland type (please circle the applicable codes for wetland types as listed in Annex I of the Explanatory Note and Guidelines document):
   - inland: L, M, N, O, 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: J, O, Q, E, A, H, Sp, Tp, Ts, 5, 9, L, M, N, Xf.

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: 3b

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:
    HELLENIC MINISTRY OF ENVIRONMENT, PHYSICAL PLANNING AND PUBLIC WORKS
12. Justification of the criteria selected under point 9, on previous page
Criterion 1: see Section 14
Criterion 2: see Sections 17 and 18
Criterion 3: see Section 18
Criterion 4: see Section 18

13. General location: The area is situated in North-Eastern Greece, Thraki (Thrace). The most proximate towns are Xanthi, a town of 37,500 inhabitants at 25 km, and Komotini, a town of 40,000 inhabitants at 23 km, which are the administrative centres of the Prefectures of Xanthi and Rodopi respectively.

14. Physical features:
Geology and geomorphology: Vistonis Lake and Porto Lagos lagoon are located in an alluvial plain with strong characteristics of delta morphology and coastal dynamics and bordering tertiary hills. Lake Ismaris and its adjoining lagoons are located in an alluvial lowland plain with tertiary hills. The main geological substrates of the adjoining lagoons are sedimentary deposits of tertiary, quaternary and contemporary alluvial deposits.
Origins: It is a natural ecosystem partly modified by human interventions.
Hydrology: Vistonis Lake is the recipient of three main river courses, Kosynthos at the North, and Kompsatos and Travos at the east, while several smaller torrents flow into this shallow basin. The amount of water flowing into Vistonis reaches \(360 \times 10^6\) m\(^3\)/year with an average annual discharge of 11.4 m\(^3\)/sec. During winter the discharge is higher (32 m\(^3\)/sec) and during summer (July, August, September) it is lower (2.41-1.8 m\(^3\)/sec). In the last years, during summer months there is no discharge in the lake because the water is consumed for irrigation. During summer months Vistonis receives sea water through its southern natural outlet, ending in the harbour of Porto Lagos, and an artificial canal at its west (500m long, 20m wide and about 1.3m deep). Porto Lagos is located south of Vistonis and is connected directly to the sea.

Lake Ismaris is the recipient of Bospos river (30,000 m\(^3\)/year) and Filiouris river (250,000 m\(^3\)/year) which, through the eastern part of the lake, flows into the sea. The adjoining lagoons are mainly fed by underground waters and precipitation.
Soil type and chemistry: Lake Vistonis, Porto Lagos, and Lake Ismaris are dominated by silty and clay soils, but there is also sand. The adjoining lagoons are dominated by silty, clay and sandy soils.
Water quality (physico-chemical characteristics): In Vistonis Lake the pH values range from 6.5-8.5, while low quantities of dissolved oxygen, and high turbidity have been recorded. During winter, Vistonis consists mainly of freshwater as it receives increased supplies from the three rivers. In summer, the water becomes brackish due to evaporation,
water abstraction for irrigation and low river inflow. It is considered eutrophic and periodically shifts towards a hyper-eutrophic state with frequent algae blooms. Porto Lagos has mostly saline water.

Ismaris was initially a freshwater lake, but since 1985 a massive entrance of sea water via the southern outlet of the lake was created and turned it into a brackish lagoon. Nowadays the observed increased salinity is caused by large scale extraction of fresh water for irrigation purposes. Large variations of salt concentration have been recorded relating on season and climatic conditions. It is considered eutrophic mainly due to agricultural runoffs from the adjacent agricultural land. The pH values range from 6.5-7.1. The adjoining lagoons are saline, and they are considered as eutrophic

Depth, fluctuations and permanence of water: Vistonis Lake has a depth of 2-2.5 m. Lake Ismaris is shallow with a maximum depth of 2 m. A significant water level decrease occurs during the summer months. The adjoining lagoons have a depth of 0.2-2 m.

Tidal variations: Port Lagos is characterized by tidal variations. The adjoining lagoons have a very narrow tidal variation.

Catchment area: Vistonis catchment area is 1,334 km² and Ismaris catchment area is 1,192 km².

Climate: The climate is intermediate between Mediterranean and mid-european type. Minimum air temperatures occur in January (4.4°C-5.4°C) while maximum temperatures occur in July (23.8°C-25.8°C). The average monthly precipitation in a year is 60 mm. The wettest month is December (108.7 mm) and the driest is August (21.3 mm).

15. Hydrological value:
The whole area is of outstanding importance for the recharge of groundwater. Lake Vistonis is an important system for controlling floods coming from the entering rivers and for sediment trapping. Ismaris Lake controls flooding too. Besides, irrigation water supply consists a significant hydrological value of the area.

16. Ecological features:
The whole complex wetland is a biotope of great importance because of the diversity of its habitats, animal and plant communities and bird and flora species. Many of these species are rare and endemic. It is a very important migration and wintering area for many species of waterfowl. The proximity of many water surfaces offers better protection and refuge from shooting. The adjacent hills host important and diverse populations of birds of prey feeding around the marshes.

Vistonis Lake is fringed with reedbeds (*Phragmites australis, Typha angustifolia*). The surrounding area includes zones of *Tamarix* scrub (the greatest of Greece), salt marshes, and periodically flooded meadows while the mouths of the rivers Kosynthos and Kompatsatos support sandflats, and riparian forests (heavily overgrazed) dominated by *Ulmus minor, Salix sp., Populus sp., Fraxinus angustifolia, Alnus glutinosa*, and *Platanus orientalis*. The aquatic bed vegetation consists mainly of *Potamogetos sp.*, *Trapa natans, Lemna minor, Hydrocharis morsus-ranae*, and *Myriophyllum sp.* Porto Lagos lagoon has many islands and is surrounded by salt marshes (*Arthrocnemum fruticosum, Salicornia europaea, Aeluropus littoralis, Juncus maritimus, J. acutus*), some sand dunes (*Pancratium maritimum, Suaeda maritima, Euphorbia peplis, Ammophila arenaria*), tamarix scrub, and a reforested area of *Pinus sp.* The close-by tertiary hills, with Mediterranean macchia, increase considerably the variety of the biotope.
Lake Ismaris is surrounded by extended reed beds (*Phragmites australis, Typha angustifolia, Scirpus lacustris*), while salt- and freshwater marshes occur along the eastern and southern parts. During summer the water surface is covered by aquatic bed vegetation (*Trapa natans, Nymphaea alba, Lemna minor, Nuphar lutea, Nymphoides peltata, Ranunculus trichophyllus, Najas minor, Potamogeton spp.*) providing nesting sites for *Chodonias hybridus*. A small riparian forest consisting mainly of *Salix spp.* (but also of *Populus alba, Alnus glutinosa, Ulmus minor, Fraxinus angustifolia*), lies at the mouth of the river Bosbos, along the northern shore.

The adjoining lagoons area is surrounded by halophytic marshes (*Halimione portulacoides, Halocnemum strobilaceum, Salicornia europaea, Artemisia monogyna*) and sand dunes (*Pancratium maritimum, Euphorbia paralias, E. peplis, Suaeda maritima, Salsola kali, Ammophila arenaria*) in quite natural condition. There are also two reforested areas one between Xirolimni and the sea shore with *Populus alba, Acer negundo e.t.c.* and the other between Ptelea and Alyki with *Pinus maritima*.; sand works in the northern part of Alyki; a small intermittent stream, whose bed has been diverted from the north western to the eastern side of the lagoon; and rocky shores in the south of Ptelea lagoon.

The entire coastal zone of the wetland complex is consisted of a variety of habitat types as *Posidonia* beds, mudflats and sandflats not covered by seawater at low tide, annual vegetation of drift line, *Salicornia* and other annuals colonising mud and sand, Mediterranean salt meadows (*Juncetalia maritimi*), Mediterranean and thermo-Atlantic halophilous scrubs (*Arthrocnemetalia fructicosae*), embryonic shifting dunes, fixed dunes with herbaceous vegetation (grey dunes), shifting dunes along the shoreline with *Ammophila arenaria* (white dunes).

17. **Noteworthy flora:**
The species *Pancratium maritimum* is growing in wild and it is seriously endangered by the human activities on the coast. The species *Trapa natans* (classified as “vulnerable” by the IUCN catalogue), *Salvinia natans, Oenanthe tenuifolia, and Groenlandia densa* are included in WCMC. Also the *Fraxinus angustifolia* is considered as “rare”. Hydrophytic species, like *Potamogeton spp., Myriophyllum spicatum, Ceratophyllum spp.* provide valuable habitats for fish species. The species *Leymus racemosus ssp. sabulosus* reaches its extreme distribution limits in Northern Greece.

18. **Noteworthy fauna:**
In the wetland complex bird life is abundant at all seasons. Vistonis lake and Porto Lagos is the second most important migration stop over and wintering site for *Pelecanus crispus* (101-250 individuals) nesting at Lake Mikra Prespa. Midwinter counts carried out show that the average number of wintering pelicans has remained stable during the period 1982-1991 but is significantly higher than the 1964-1974 wintering population, while peak numbers have reached 400 individuals. *Pelecanus onocrotalus* (51-100 individuals) is also staging here. There is also a large heronry (*Egretta garzetta*: 330 pairs breeding and 51-100 individuals wintering; *Egretta alba*: 51-100 individuals wintering, *Ardea cinerea*: 120 pairs breeding and 11-50 individuals wintering; *Ardeola ralloides*: 6-10 pairs breeding) in a pine reforestation in Porto Lagos and another one with *Nycticorax* species in the reeds. Since 1983, in the salt water of Porto Lagos, an increasing population (more than 3000) of *Phoenicopter ruber* is being observed, while the few breeding attempts provide indications that this species could eventually start breeding also in Greece. Other breeding species...
included in Annex I of 79/409 EEC Directive are: *Ixobrychus minutus* (11-50 pairs), *Ardea purpurea* (15 pairs), *Ciconia ciconia* (51-100 pairs), *Aythya nyroca* (20 pairs), *Circus aeroginosus* (1-5 pairs), *Himantopus himantopus* (100 pairs), *Recurvirostra avosetta* (45 pairs), *Sterna hirundo* (251-500 pairs), *S. albifrons* (11-50 pairs) etc. Among the 214 migratory species that breed, winter or stage in the area, 78 species are included in Annex I of 79/409 EEC Directive.

Ismaris Lake hosts the last colonies of *Platalea leucorhodia* (15 pairs breeding) and *Plegadis falcinellus* (1-5 pairs breeding) with *Egretta alba* (6-10 individuals wintering), *Ardea purpurea* (6-10 pairs breeding) and *Ixobrychus minutus* (20 pairs breeding) in Greece. Moreover few pairs of *Ardea cinerea* occur there. Other breeding species included in Annex I of 79/409 EEC Directive are: *Nycticorax nycticorax* (60 pairs), *Aythya nyroca* (6-10 pairs), *Himantopus himantopus* (20 pairs), *Recurvirostra avosetta* (1-5 pairs), *Glareola pranticola* (51-100 pairs), *Chlidonias niger* (150 pairs) etc. Among the 139 migratory species that breed, winter or stage in the area, 46 species are included in Annex I of 79/409 EEC Directive.

Regarding fish species, five of them are included in Annex II of 92/43/EEC Directive (*Alosa fallax*, *Rhodeus sericeus amarus*, *Chalcalburnus chalcoides*, *Cobitis taenia*, *Aphanius fasciatus*). In Vistonis Lake and Porto Lagos there are four endemic fish species: *Alosa alosa vistonica* (also “endangered”), *Leuciscus cephalus macedonicus*, *Gobio gobio bulgaricus*, *Chalcalburnus chalcoides macedonicus* (also “vulnerable”). In Ismaris Lake there are three endemic fish species: *Alosa alosa vistonica* (also “endangered”), *Leuciscus cephalus macedonicus*, *Cobitis strumicae*.

Regarding other fauna categories the following species, that are included in Annex II of the 92/43 EEC Directive, have been observed in the area: 8 amphibians and reptiles: *Triturus cristatus*, *Bombina variegata*, *Testudo hermanni*, *T. graeca*, *Emys orbicularis*, *Mauremys caspica*, *Elaphe quatuorlineata*, *E. situla*; one invertebrate *Lucanus cervus*; one mammal *Lutra lutra* (>30 individuals). Other mammal species classified as “vulnerable” by the National Red Data Book are: *Canis lupus*, *C. aureus*, *Meles meles*, *Glis glis*.

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

Agricultural and grazing activities around the lake constitute the principal social values for local people. Fish production in Vistonis brings in a valuable income as well, especially from eels. There are considerable archaeological sites inside the wetland area, close to Ismaris and Elos lagoon, Porto Lagos, Anastasiopolis.

Since 1996, there has been an increase of the social acceptance and value of the site as a protected area and eco-tourism, environmental education and bird watching have been enhanced. Moreover the area is of great scientific value in the fields of biology, ecology, hydrology and geology.

20. **Land tenure/ownership of:**

(a) site: In general it is state owned (90%)
(b) surrounding area: Partly state and private owned.
21. Current land use:
Site: Within the Ramsar site, about 5,175 people are living mostly in small communities. Agriculture, grazing, and lagoon fisheries used to have an almost uniform spatial distribution, in the past. During the last 10 years, however, grazing has been restricted due to the expansion of modernised agriculture. Fishing in the lagoons is undertaken by cooperatives and private companies. There are also two salt pans with a production of 800 t per year. A few settlements exist in the coastal zone and tourism activities mostly take place along the Porto Lagos coastline.
Surroundings/ catchment: Agriculture, grazing and forestry are the main activities in the surroundings.

22. Factors (past, present or potential) adversely affecting the site’s ecological character, including changes in land use and development projects:
The alluvial deposits of the torrents around lakes Vistonis and Ismaris have increased due to the destruction of the riparian and uphill vegetation in the catchment during the 80's. This has lead to the decrease of the volume of both lakes, and measures have been taken to re-establish the vegetation in the eroded areas of the catchment basin of Vistonis. The increasing demand for irrigation water, both surface and underground is also influencing the water level of Lake Ismaris (low in summer months) and the salinity of Lake Vistonis (increased in summer months), leading to subsequent changes in vegetation. Lack of freshwater and massive deaths of commercial fish in Vistonis, during the 80's has lead to the opening of communication channels to the sea in most lagoons and the control of sea water entering by sluices.

Run-off from agricultural, domestic and to a lesser extend industrial (mainly food processing) sources may affect the water quality of the wetlands and mainly that of Lake Ismaris. In the latter, concentration of certain heavy metals has been considered high.

Flood management has been considered a priority issue for lake Vistonis and there are plans for constructing dikes along its coast. As the deposition of sand and sludge from the torrents in Lake Vistonis is considered a threat to fish spawning sites, managing soil erosion and water resources in the catchment area is very important.

Extension of agriculture towards the wet meadows of the lake, overgrazing at the eastern side and removal of Tamarix shrubs are also priorities for management. Hunting is prohibited in most parts of the area and the heronry at Porto Lagos is effectively protected; incidents of illegal hunting have gradually decreased.

Fisheries management in the lagoons includes works for maintaining and enhancing habitats for fish and environmental terms have been imposed on their implementation.

A procedure for approval of Environmental Terms for a number of works and activities through Environmental Impact Assessments/ Studies has been established in Greece in 1990. Aiming to holding back the further loss and degradation of the site, all relevant planned works 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.
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)

**A set of measures and delimitation of zones** are enforced since September 1996 by the Ministries of Agriculture, Environment and Development. The main zones and measures can be shortly described as follows:

**Zone A** includes lakes Vistonis and Ismaris, the permanent or seasonal marshes, lagoons, a small forest near Porto Lagos and shallow coastal areas. In zone A, permitted activities (under specific terms) are: traditional fishing and aquaculture; restricted sailing; maintenance of existing fisheries infrastructure; restricted construction of new infrastructure for aquaculture; maintenance of existing agricultural activities, poplar plantations, salt works, existing settlements (expansion is forbidden); maintenance of archaeological sites; scientific research; management works for conservation and rehabilitation of species and habitats; daily visits (restricted to nature observation and swimming); grazing at the eastern side of Lake Vistonis; observation, study and conservation of avifauna at the forest near Porto Lagos Lagoon.

**Zone B** includes a peripheral zone of the parts of the places belonging to zone A and shallow coastal areas. In this zone permitted activities (under specific terms) are: maintenance of existing agricultural activities and existing settlements (expansion is forbidden), maintenance and modernisation of existing infrastructure, scientific research; works for conservation and rehabilitation of the environment; mild recreation (restricted visits for nature observation, swimming); grazing in restricted areas; small stables; aquaculture and fishing.

Zones A and B comprise the Ramsar site. Measures have also been identified at a buffer zone in the wider/catchment area which includes mainly agricultural land and grazing fields. In this zone, permitted activities (under specific terms) are; hunting, scientific research, agriculture, grazing and aquaculture; maintenance and modernisation of infrastructure; establishment of light energy production; maintenance of existing archaeological sites; housing, building of storage rooms, water tanks, green houses, infrastructure for agricultural activities, athletic installations, public buildings, parking places, entertainment units, hotels; animal breeding stations and slaughter houses.

Zones A and B have been proposed for inclusion in the NATURA 2000 network under the code GR1130009. Parts of these zones are already an SPA under the code GR1130010. Within the site a game refuge has been established.

**A Preliminary Management Scheme** has been operating since 1997 on the site, 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. The Programme Agreement has an Annex with the planned works and activities, their time-table (1996-1999) and budget. Priority actions include monitoring of water quality, visitor management (placement of signs, construction of warden houses,
observation towers), operation of information centres training of staff and warding of this 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.

Conservation actions have been taken by the competent authorities in co-operation with the Hellenic Ornithological Society for the Heron colonies in Porto Lagos lagoons. Works for flood attenuation are in progress.

The sewage treatment station of the city of Komotini is completed therefore improving the quality of the effluents that flow into Lake Ismaris. Stations monitoring the quality of water have been established.

The site is included in the Montreux Record since 1990.

24. Conservation measures proposed but not yet implemented: (e.g. management plan in preparation; officially proposed as a protected area etc.)
Along with the neighbouring Ramsar site Nestos Delta, Lake Vistonis, Porto Lagos, Lake Ismaris and adjoining lagoons, 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).

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. Moreover, numerous conservation projects are proposed in accordance with the "Guidelines on Management Planning for Ramsar sites and other Wetlands". These projects include monitoring, detailed study of the hydrology with proposed measures, works for the lowering of the level of pollutants, clearing of the connection of Lake Ismaris with the sea, hydraulic works for the sustainable use of water, infrastructure for the development of ecological tourism, mapping of the habitat types.

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 fertilises used.

25. Current scientific research and facilities: (e.g. details of current projects; existence of field station etc.)
A monitoring and conservation project is in progress for Phalacrocorax pygmaeus and Anser erythropus undertaken by WWF and the Hellenic Ornithological Society.
A long term study of the pelican colony is under way since 1985.
A project monitoring the quality of the water of Lake Ismaris was conducted by the Polytechnic School of Thrace.
26. **Current conservation education:** (e.g. visitors centre, hides, information booklet, facilities for school visits etc.)
A fully equipped Information Centre is established in the site, accompanied by constructions for bird watching, guardhouses etc. This infrastructure supports the activities of information - public awareness, environmental education, monitoring etc. 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 wetland is not primarily used for tourism, however there are such activities along the extended coastline. In general, tourism in the area is not significantly developed. In 1995, about 400 hotel bed places for tourists existed in the wider area, which was visited by about 2000 people.
Resort houses at the coastal areas have been increasingly attractive and special thickets for such development have been identified, outside the Ramsar site. Eco-tourism could be an interesting developmental aspect since bird watchers that visit especially Porto lagos are increasing in numbers.

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 Anatoliki Makedonia & Thraki. Concerning the functional (conservation) jurisdiction, co-ordination lies with the Ministry of Environment in collaboration with the Ministry of Agriculture, the Prefectures of Xanthi and Rodopi 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 presided by a representative of the local authorities. Secretarial assistance is provided by:
Information Centre of Vistonis
Nea Kessani
GR-670 63 Lagos
GREECE
Tel: +30-541-96269, Fax: +30-541-96732

30. **Bibliographical references:** (scientific/technical only)