Assessment of the Greek Ramsar wetlands

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INTRODUCTION

What are the current threats to Greek wetlands? How is human presence incorporated into the wetland habitat? Who is responsible for the management of protected wetlands in Greece? The WWF-Greece project "Scoring a wetland" aims to address such questions. WWF-Greece hopes that the answers will bring us closer to the proper management and conservation of these valuable habitats.

This project has two main objectives:

1. *To enable the basic features of wetland management in Greece to be distinguished and to identify the real problems which need to be resolved*
2. *To serve as a basis for the Water and Wetland Index, developed by the European Freshwater Programme and applied in 18 European countries*

As the experience from the forest scorecards project has shown, it is very difficult to prepare a questionnaire that will sufficiently demonstrate all aspects of adopted management practices and conservation measures, even at a national level. Differences in protection status, wetland type and size, environmental policies and the actual situation of a given wetland render the general application of a set of questions a difficult task. Apart from the basic distinction between southern and northern countries, differences in wetland types and size, environmental policies and actual situation, affect the general application of a set of criteria. A typical example of this could be that even among the EC countries the degree of compliance with EC Directives that set the framework for management plans, such as 92/43/EEC, varies significantly.

The elaboration of the assessment criteria

The first phase of the project started in December 1998 and focused on the elaboration of a comparative and detailed method of describing the current status and threats of the Greek wetlands. The intention of this effort was to be integrated in order to be functional for future assessments. The recording of the data should be done in an organised way that would permit the monitoring of a certain wetland and also the comparison between different wetlands. Finally, a questionnaire was formulated (Annex I), and was initially answered for the ten Greek Ramsar wetlands, by WWF-Greece partners possessing a thorough knowledge of the respective wetlands.

Similar attempts of wetland description and evaluation have been made in the past by public authorities and organisations (e.g. relevant ministries and the Ramsar Secretariat) at a national and international level. However, the majority of these focus on one basic aspect like human activities or preparation for a management plan. In the present report several aspects such as management type, setting of boundaries, type and intensity of human activities, ecological changes, etc. were incorporated in a single text.

The material used was the wetlands that are, or will soon be, under an official protected status (Ramsar wetlands, surrounding areas proposed for the ecological network Natura 2000). Since their

protected status is due to their recognised ecological value, there was no meaning in presenting a justification for the protection of these wetlands in the form of long lists of important habitats and species. Instead, emphasis was given on the factors that may threaten and alter their diversity and ecological wealth: on human activities and their consequences and on the way these wetlands are managed both by local stakeholders and by the state. A basic description of the sites' abiotic and biotic features is also included.

Ramsar wetlands

Greece has been a Contracting Party to the Ramsar Convention since 1975. It was in fact the accession of Greece, as the seventh contracting party to the Convention, which brought this Convention into force.

Eleven Greek wetlands were declared as Wetlands of International Importance (Ramsar wetlands) in 1975. However, the actual number of Greek Ramsar wetlands is ten[1] since two sites, lake Ismarida and adjoining lagoons and lake Vistonida - Porto Lagos wetland, are unified to form one. In spite of the early adoption of the Convention by Greece, the delay in the sites' delimitation was for many years a source of embarrassment and concern both to the Greek government and to the Ramsar Bureau. Details on the provisional borders of the Ramsar sites were sent in 1988 but it took almost ten more years before the final boundary maps were eventually communicated in 1996.

The Greek Ramsar sites fulfil, to a lesser or greater extent, all the relative identification criteria sets. Almost all of them meet the majority of the "general criteria based on plants or animals" and the "specific criteria based on waterfowl or fish". Regarding the "criteria for representative or unique wetlands", they are all classified as particularly good representative examples of natural or semi-natural wetlands characteristic of the Mediterranean biogeographical region. With the exception of lake Mikri Prespa, which is not connected to a major river basin, all the others have been proposed as representative examples of wetlands which play a substantial hydrological, biological or ecological role in the natural functioning of a major river basin or coastal system.

The first set of wetlands to be evaluated in this wider project were the Greek Ramsar sites. This selection was based on the relative availability of data and also on the fact that these are basically the only wetlands in which efforts for their organised management have been initiated through the Programme Agreements[2] (even if these had not yet expired or had not been fully applied at the time of the assessment). In a next phase the same procedure is followed for wetlands proposed as Sites of Community Interest (SCIs) for the ecological network Natura 2000).

[1] Evros delta, lake Vistonida - Porto Lagos - lake Ismarida and adjoining lagoons, Nestos delta and adjoining lagoons, lake Kerkini, lakes Volvi and Koronia, Axios - Loudias - Aliakmon delta, lake Mikri Prespa, Amvrakikos gulf, Mesolonghi lagoons, and Kotychi lagoon.

[2] The Programme Agreements were signed for the 10 Greek Ramsar wetlands and another 23 wetlands by the Ministry of the Environment, the Prefectural and Peripheral authorities, and the surrounding communities. Their purpose was to implement priority conservation measures, to operate the Information Centres, and to organise public awareness and sensitisation projects and activities. For more details see chapter on Management.

The 7th Ramsar Conference of Parties in May 1999 in Costa Rica was another reason why such an evaluation was at the time important for Greece. The Greek government was actively working for the exclusion of, at least some, Ramsar sites from the Montreaux record. The Ramsar Information Sheets, submitted by the Greek government were quite misleading. Positive actions were exaggerated while others that had a clear negative effect on the respective wetlands were played down. An expert committee had also been formulated to propose which Ramsar sites should be excluded from the Montreaux during COP7. WWF-Greece also decided to provide the Ramsar Bureau with information on these sites so as to assist in the decision making process.

Finally, before the Ramsar COP7, and based on the results of the project, WWF-Greece proposed together with the Hellenic Ornithological Society a series of modifications to the Ramsar Resolutions text. The spirit of the modifications was discussed before the meeting with the authorities from the Ministry of the Environment, Physical Planning and Public Works (which will be referred to as Ministry of the Environment hereafter). During COP7, after new negotiations with representatives of the European Freshwater Programme of WWF and of Birdlife International, the draft was finally accepted with changes of minor importance by the Greek delegation and submitted to the Ramsar Bureau.

It should be pointed out however that this study was not restricted to the boundaries of the Ramsar sites. In order to have a functional unit it refers to the actual area of the wetlands (as defined by the Ramsar criteria) and their wider surroundings, still without extending to their whole catchment area. Along the same line, the phrase “around the wetland” refers to the wetland area that lies outside the Ramsar borders but inside their wider surroundings. The writers of the report recognise that this is a functional rather than absolute definition.

The questionnaires were distributed and answered from May to October 1999 (Information has been updated up to October 2000). During this period developments on the long-standing problem of the institutional framework for the establishment of functional management bodies have advanced more than in the past 15 years. A newly approved law 2742/99 (7/10/1999) promotes the adoption of a coherent management of protected areas (wetlands included) by organising the framework and procedure for the formation of management bodies.

To increase the relevance of the report, the recent developments have been included and discussed in the relevant chapters when possible, especially so in the Conclusions chapter.

In compliance with the country’s commitments to international conventions (i.e. the Ramsar Convention), management bodies are expected to be established in the Greek Ramsar wetlands. We hope that this report, by highlighting weaknesses and stressing the existing efforts, will serve as a useful reference and tool for the management bodies that will be established, especially regarding the identification of needs and main gaps in available information.

The WWF-Greece partners that contributed to the answering of the questionnaires from north-eastern to south–western Greece were:

Site name	**Source of information**
Evros Delta	Stella Kladara
Lake Vistonida and Porto Lagos Lagoon, Lake Ismarida and adjoining lagoons	Maria Panagiotopoulou, Stella Kladara and Panagiota Maragou
Nestos Delta and adjoining Lagoons	Maria Panagiotopoulou and Stella Kladara
Lake Kerkini	Theodoros Nazirides and Daphne Mantziou
Lakes Volvi and Koronia	Yiannis Tsougrakis
Axios - Loudias - Aliakmon Delta	Chrysoula Athanasiou
Lake Mikri Prespa	Myrsini Malakou and Yiannis Kazoglou
Mesolonghi Lagoons	Fotis Pergantis
Amvrakikos Gulf	Fotis Pergantis
Kotychi Lagoons	Panagiota Maragou

The completed answered questionnaires are attached as a separate volume.

This report is based on the information included in the questionnaires and on data from the literature cited either here or in the questionnaires.

REPORT ON THE ANSWERS

SITE DESCRIPTION

Most Greek Ramsar wetlands lie in northern Greece. This is logical since it is in this part of Greece where some of the larger rivers of the country (Axios, Aliakmonas, Loudias, Strymonas, Nestos and Evros) flow into the Aegean Sea. With the exception of Strymonas, all the other rivers form extensive deltas. Western Greece, significantly more wet due to the high Pindos mountains, also hosts large rivers, like Aracthos and Louros that form the double delta of Amvrakikos, or Acheloos and Evinos that flow into the Mesolonghi lagoons. Five out of ten Greek Ramsar wetlands are river deltas and one (lake Kerkini) is directly associated with a river.

Another explanation for the presence of large and important wetlands in northern Greece is the fact that, according to Greek geological history, this is a much "older" part of the country. This agrees with the very old geological age of the lakes like Mikri and Megali Prespa, and the fact that the lakes Volvi and Koronia actually occupy the deepest parts of the former Mygdonian lake. Moreover, the majority of Greek river deltas were developed during or before the Holocene.

Almost all Greek Ramsar sites are coastal wetlands of the Mediterranean type. They include river deltas and associated riverine habitats, estuaries, coastal lagoons, permanent and temporary freshwater or brackish lakes and marshes.

Their mean size is 16,350 ha varying from 5,078ha in lake Mikri Prespa to 33,687ha in Messolonghi lagoons. Since most of the Greek Ramsar wetlands are deltas, their mean altitude is less than 20m; with the exception of lake Mikri Prespa that is the highest Greek lake and is situated 853.50m above sea level.

Ownership status

In most cases the actual wetland area belongs to the state, while the surrounding area is both state and private/community owned. It is also common for the state to lend or allocate the surrounding area to local municipalities and communities for agricultural use or livestock grazing.

Inside the wetland the part owned by the state is usually more than 90%. Unfortunately, it was not feasible, at least in the available short-time study period, to estimate the exact percentages of private and state owned surrounding land in the examined wetlands. In fact, not only is there lack of data showing basic information on ownership, lease etc., but also lack of updated and comprehensive maps of the wetlands. In three wetlands, Prespa, Kotychi and Evros, there are no updated maps. In the other wetlands the existing updated maps (1:10,000, 1:20,000, 1:50,000) are the ones included in the relevant Specific Environmental Studies[3] on the geology, land cover, land

[3] See chapter on Management.

use infrastructures, protection zones etc. These maps are usually available at the local Information Centres.

The case of Mikri Prespa is a representative case of mixed ownership status: being the core area of the National Park since 1974, the wetland area around the lake should have been expropriated by the Greek State. Nevertheless this has not been done till today, 25 years after. As a result the largest part belongs to the surrounding communities and a small part is private.

In theory the predominantly state character of the sites could be a very positive factor in terms of management. However, eventually the surrounding communities become the main responsible agent for the "hands on" management of the wetland area. Thus, in accordance to the basic agricultural use of the surrounding land, their management and development choices depend largely on agricultural policy.

It should also be noted that even when the wetland area is state owned it may belong to more that one ministries or authorities that plan and act independently. That may also apply to the local level, since more than half of the sites belongs to more than one prefectures and/or municipalities, each one acting on behalf of its own local interests.

Legal status

Various attempts have been undertaken to document the important situation of the Greek Ramsar sites. All sites have been proposed as Sites of Community Importance (pSCIs) under the Habitats Directive (92/43/EEC) and as Special Protection Areas (SPAs) under the Birds Directive (79/409/EEC). Almost all include wildlife reserves.

Joint Ministerial Decisions (JMDs)[4] have been issued for the zoning and protection of all sites, except for the lakes Koronia & Volvi where the JMD has not been signed yet by all relevant ministries.

Lake Mikri Prespa that is protected by almost every possible regulation is also one of Greece's ten National Parks, a Site of Natural Beauty and a Biogenetic Reserve according to UNESCO. Kotychi lagoons are also protected by the Barcelona Convention, and lakes Koronia & Volvi are MEDSPA sites.

The borders of each protected area are defined by different principles. Usually the JMDs define the broader wetland area since they also include part of the catchment area as a buffer zone. Based on these, all the questionnaire respondents agree that finally the wetland area is adequately represented in the designated protected area, although some problems concern the Evros delta and the Porto Lagos lagoon. The eastern part of the Evros delta has not been included in the Ramsar and Natura 2000 delineations regardless of its natural value. In the JMD this area is under a special status. The Ministry of the Environment attributes this to reasons related to external affairs since it is the borderline between Greece and Turkey. Porto Lagos lagoon, which is one of the most important

[4] See chapter on Management.

lagoons of northern Greece, and the inundation zone around lake Vistonida have been excluded from the strictly protected zone of the wetland. It is interesting to note that unlike other European countries where pSCIs tend to be small and to include only the habitats of community importance, in Greece the usual case is that the Natura 2000 site is much larger (average size 11,275 Ha) and engulfs the Ramsar site. A characteristic example of this relation between the two is the case of the lakes Kerkini and Mikri Prespa: the Ramsar boundaries are restricted to the water body whereas the relevant proposed Sites of Community Importance are large enough to include large part of the surrounding catchment area as well. This makes also more sense management-wise since the Habitats Directive applies to a broader range of habitats than only wetland ones. It has also more powers to resource to formal complaints or to the European Court. It is expected that this approach will enhance the processes relating to management and monitoring of wetland sites.

The complexity of the Natura 2000 zonation is nevertheless sometimes puzzling. In Kotychi lagoons, the Natura 2000 site GR2320001 does not include the actual Kalogria lagoon even though it is mentioned in the title. Furthermore the wetland area is divided in three neighbouring Natura 2000 sites without apparent reason. A similar problem is observed in Vistonida and Porto Lagos, where the very important Porto Lagos lagoon is omitted from the site GR1130010 despite its inclusion in the official site name. Moreover, GR1130010 is part of its surrounding GR1190009! In Evros delta the very important eastern part of the delta has been excluded from the site GR1110001.

A basic problem stems, as it is clearly stated in the Prespa[5] questionnaire, from the different regulations applying to different parts of the wetland. Each authority, convention etc. aims at conserving different parts and values of the site and is usually based on a different concept. Moreover, part of the existing regulations and laws is virtually impossible to apply. In the case of Mikri Prespa, according to the standing rules of the National Park, fishing should be prohibited and no visitors are allowed in the core area after sunset. The core area includes villages where fishing is a basic source of income and as a result these rules cannot be implemented.

The co-ordination of authorities and responsibilities is vital for the achievement of synergy in the processes relating to conservation and management of important wetland areas.

National and trans-border Ramsar wetlands

The trans-border Ramsar wetlands of Greece are the Evros delta and the lake Mikri Prespa (75% and 92% respectively belong to Greece). Three other sites, Axios delta, Nestos delta and lake Kerkini have trans-border watersheds.

As it is stated in the Greek Ramsar National Report (1999) co-operation activities for the management of the Strymonas watershed have started with Bulgaria. These refer mainly to the river discharge and the management of sediments that are a serious problem of lake Kerkini. A co-operation with Bulgaria exists also for the Evros delta. Up to now there are no bilateral or multilateral activities regarding the management of Evros delta, a true trans-border wetland.

[5] The term “Prespa” is used to describe the whole wetland

Recently, after an initiative of the Society for the Protection of Prespa (SPP) and WWF-Greece, and the positive reaction of the Greek side, discussions were carried regarding the establishment of a trans-boundary protected area at the Prespa region, focusing on the sustainable development and integrated management on a catchment scale. An agreement was reached and on the World Wetlands Day, on February 2, 2000, the Prime Ministers of Albania, Former Yugoslav Republic of Macedonia, and Greece signed a Declaration establishing the Prespa Park, the first trans-boundary protected area within the Balkans. Full text of the Declaration is presented in Annex II.

The Declaration was to be followed by enhanced co-operation among competent authorities in the three countries in order to maintain and protect the unique ecological values of the Prespa Park, prevent and/or reverse the causes of its habitat degradation, and explore appropriate management methods for the sustainable use of the Prespa lakes' water. The first steps of this long-term co-operative process took place at the Tirana meeting of government officials and NGOs from the three countries (16-17 October, 2000), where it was decided to establish a trilateral Co-ordination Committee for the Prespa Park, to prepare a Strategic Action Plan for the sustainable development of the Prespa Park and to carry out the first essential infrastructure projects in the three countries that will permit co-ordinated monitoring activities in the future. All these measures will be initially funded by the Greek government.

Wetland types

In the Greek Ramsar wetlands we find 31 different wetland types. The types that appear in most wetlands are the seasonal/intermittent freshwater marshes, seasonally flooded meadows, natural wet meadows (Ts), the canals and drainage channels, ditches (9), the coastal brackish/saline lagoons (J), the salt marshes and salt meadows (H), and the permanent rivers (M). A full account of all wetland types is presented in Table 1.

Table 1- The commonest wetland types found in the wider Greek Ramsar wetlands. #: listing according to references from the ten wetlands, **wetland code**: according to Ramsar classification, **wetland description**: according to Ramsar classification.

#	Code	Wetland description
1	Ts	Seasonal/intermittent freshwater marshes/pools on inorganic soil; includes sloughs, potholes, seasonally flooded meadows, sedge marshes.
1	9	Canals and drainage channels, ditches
2	J	Coastal brackish/saline lagoons; brackish to saline lagoons with at least one relatively narrow connection to the sea.
2	H	Intertidal marshes; includes salt marshes, salt meadows, saltings, raised salt marshes; includes tidal brackish and freshwater marshes.
2	M	Permanent rivers/streams/creeks; includes waterfalls.
3	O	Permanent freshwater lakes (over 8 ha); includes large oxbow lakes.
3	A	Permanent freshwater lakes (over 8 ha); includes large oxbow lakes.
3	Xf	Freshwater, tree-dominated wetlands; includes freshwater swamp forest, seasonally flooded forest, wooded swamps; on inorganic soils.

3	3	Irrigated land; includes irrigation channels and rice fields.
4	1	Aquaculture (e.g. fish/shrimp) ponds
5	D	Rocky marine shores; includes rocky offshore islands, sea cliffs.
5	E	Sand, shingle or pebble shores; includes sand bars, spits and sandy islets; includes dune systems.
5	F	Estuarine waters; permanent water of estuaries and estuarine systems of deltas.
5	G	Intertidal mud, sand or salt flats.
5	K	Coastal freshwater lagoons; includes freshwater delta lagoons.
5	Sp	Permanent saline/brackish/alkaline marshes/pools.
5	Ss	Seasonal/intermittent saline/brackish/alkaline marshes/ pools
6	L	Permanent inland deltas.
6	N	Seasonal/intermittent/irregular rivers/streams/creeks
6	Q	Permanent saline/brackish/alkaline lakes.
6	Tp	Permanent freshwater marshes/pools; ponds (below 8 ha), marshes and swamps on inorganic soils; with emergent vegetation water-logged for at least most of the growing season.
6	4	Seasonally flooded agricultural land (To include intensively managed or grazed wet meadow or pasture).
6	5	Salt exploitation sites; salt pans, salines, etc.
6	6	Water storage areas; reservoirs/barrages/dams/impoundments; (generally over 8 ha).
7	B	Marine subtidal aquatic beds; includes kelp beds, sea-grass beds, tropical marine meadows.
7	W	Shrub-dominated wetlands; Shrub swamps, shrub-dominated freshwater marsh, shrub carr, alder thicket; on inorganic soils.
7	Y	Freshwater springs; oases.
8	P	Seasonal/intermittent freshwater lakes (over 8 ha); includes floodplain lakes.
8	U	Non-forested peatlands; includes shrub or open bogs, swamps, fens.
8	2	Ponds; includes farm ponds, stock ponds, small tanks; (generally below 8 ha).
8	8	Wastewater treatment areas; sewage farms, settling ponds, oxidation basins, etc.

On the other hand the most dominant types in the total of the Greek Ramsar wetlands are: the coastal brackish/saline lagoons (J), the permanent freshwater lakes larger than 8 ha (O), the intertidal marshes including salt marshes, salt meadows, saltings, raised salt marshes, tidal brackish and freshwater marshes (H) and the irrigated land including irrigation channels and rice fields (3).

Position in an ecological unit

Eight out of the ten Greek Ramsar sites and their surrounding areas are a series of more than one wetlands. From the remaining two, lake Kerkini is a man-made wetland in an area that used to hold a series of marshes. Kotychi is an isolated wetland complex. Both of them are in strategic positions within migration routes for birds and thus are connected to other wetlands.

The actual Ramsar borders sometimes do not include all the units of the complex, as in the case of the Axios-Loudias-Aliakmon delta and the neighbouring wetland of Aliki Kitrous and the case of the Greek part of Megali Prespa[6]. Nevertheless the complete ecological unit is always included in the Joint Ministerial Decisions (see chapter on Management). This, more integrated, approach of the National Law is expected to enhance management planning since it will be easier to take into account and monitor a larger number of factors in the catchment beyond the wetland's strict limits.

Human population

The human population in and neighbouring the Greek Ramsar wetlands is usually below 100,000 people living mostly in medium and small municipalities and communities. In 4 wetlands there is a population rise around the wetland, in another 4 sites population has been more or less stable for the past five years and in the last 2 the population is declining. Nevertheless, it appears that a five-year period is short in order to establish true population trends. It is interesting to note that in all wetlands the population has decreased significantly during the past twenty years. The observed recent increase or stability of the population can be attributed to the proximity to relatively large neighbouring towns, developing markets related to tourism and rural incentives and subsidies, especially if we consider the rising unemployment in large cities. Data show that for the period 1994-1996 the unemployment in Greece was higher in the predominantly urbanised areas than in the intermediate and predominantly rural ones.

Settlements inside the core area (zone of higher protection) of the wetland are found only in Kotychi and around Mikri Prespa. In the case of Prespa this was inevitable since the small villages around the lake and the settlement on the islet of Agios Achilios existed for numerous years before the establishment of the Natural Park and the designation of the Ramsar site. In Kotychi the two settlements with a total population of about 750 people are illegal and according to the Joint Ministerial Decision they should be removed. A similar decision has also been issued from the Council of the State and the Prefectural Authorities. Nevertheless they have not been implemented yet.

Accessibility of the wetland area

The accessibility to at least some parts of the wetland is characterised as being good to all Greek Ramsar sites. All except lake Mikri Prespa are in relatively close proximity to an urban centre of

[6] During the last COP7 the Greek delegation committed to propose Alyki Kitrous and Megali Prespa as Ramsar sites in the near future.

medium size. Usually there is a well-developed road network around the wetland and a network of rural roads, ditches and trails inside.

In some cases the easy accessibility to all parts of the wetland can be a source of management problems. Inside the site of Kotychi lagoon and the surrounding wetlands there is an extensive network of rural roads and fire breaks that provide access to all parts of the wetland. As a result it is very difficult to control the entrance and monitor human activities within the protected area. The thick vegetation and the lack of signs create a true labyrinth. The negative impact on the regeneration of the rare *Pinus pinea* forest and the road killing of many reptiles are some of the problems caused. Another negative example is the Amvrakikos gulf where the fact that all parts of the wetland are easily accessible favours the illegal resort building and increases significantly the disturbance on the wildlife.

ECOLOGICAL CHANGE

Important ecological features

The Greek Ramsar wetlands host an important diversity of habitats and a great variety of fauna and flora species. Two of them host wetland types that are considered rare or unusual for the Mediterranean region. In all Greek Ramsar wetlands more than 10 habitats of community importance, as defined by the EC Habitats Directive (92/43/EEC), are present. Moreover, they all host rare and endangered species, included in national and international Red Data Books. Just to mention some examples:

The Prespa lakes are among the oldest lakes of Europe and as a result host a large number of endemic species. There are over 1500 plant species, 45 mammals, 261 bird species, 11 amphibian, 22 reptile and 20 fish species. In Evros delta and lake Kerkini we encounter at least 300 bird species, out of the 422 that have been observed in Greece. Also in Kerkini we can find up to 10 different bird species (some of them rare) nesting in mixed colonies. In Amvrakikos gulf we encounter 27 raptor species (38 are distributed in Europe); also about 100,000 ducks, 20,000 coots and 8,000 waders winter in the wetland every year.

Unfortunately, as it is stated by the Hellenic Ornithological Society, according to the Midwinter Waterfowl Censuses the numbers of wintering birds in the Greek Ramsar wetlands are only rising in Mesolonghi and Amvrakikos (this overall rise is attributed to the greater populations of coots). They are relatively stable in the lakes Kerkini, Vistonida and Ismarida, and are falling in all the rest. In some cases, like in Kotychi and in the wetlands of Thrace (except Ismarida), the fall is dramatic.

The Greek Ramsar wetlands are also important for other taxa. 50 species of fish have been found in lake Vistonida and in Porto Lagos lagoon. In Nestos river there are 14 species of fish and 11 in the lagoons (7 species of them are endemic). More than 20 reptile species are seen in all the Greek Ramsar wetlands.

The *Pinus pinea* forest in Kotychi is the most extensive of its kind in Greece and one of the biggest in Europe. It also belongs to the group of littoral forests that have been strongly degraded or even completly destroyed by human activities all over Europe. The rare local endemic *Centaurea niederi* (only 50-100 individuals are left) also grows in the same wetland. In Nestos delta the remaining “Kotza Orman” lowland forest (ca 3,000 ha with *Salix* spp., *Alnus glutinosa* and *Fraxinus* spp.) despite its considerable problems remains the largest and most unharmed lowland Greek forest. The sand dunes in the same area are the largest and most undisturbed of northeastern Greece.

Ecological changes

With the exception of lake Kerkini, that seems to have experienced the least ecological changes during the last five years, in all other Greek Ramsar wetlands the ecological changes follow a similar pattern.

Infilling for land reclamation is a common factor causing changes in the wetland area. Either for expansion of agricultural land as in Evros and Vistonida, or for the development of illegal tourist resorts as in the coastal zone of the Thracian lagoons and Mesolonghi, they result in a decrease of sensitive habitats, like wet meadows and sand-bars. The fact that such incidents are decreasing in areas were they used to be a major problem some years ago but are rising with the increase of tourism in others, like the lagoons of Thrace, is a sad reminder of the partial and case-to-case way that similar problems are encountered. The central and local administration has not been able to tackle and prevent such situations.

Another significant factor changing the wetland area is extensive waste disposal and rubbish dumping. The communities surrounding a wetland often arbitrarily choose an area, within or near the wetland, to use as landfill. A very characteristic example of the consequences of this practise is the recent problem in Amvrakikos gulf. The old waste disposal site of the city of Arta, located north of Amvrakikos, was situated until 1985 actually on the bed of Arachtos river, which has been exposed after the interruption of its flow due to the upstream large hydro-electric dam of Pournari. In the beginning of March 2000 a small irrigation dam (called Imaret) collapsed and the released water flew through the old landfill washing away all the waste that had been only temporarily covered with gravel. Illegal sand and gravel extraction in the same area enhanced the corruption of the river bank and resulted in even more waste being washed off into the river and eventually into the downstream Ramsar site of Amvrakikos. The extend of the problem, besides the aesthetic pollution is unknown, and is expected to be more serious during summer when the inflow of fresh water into Amvrakikos gulf is significantly reduced.

Even though it is recognised that Greece lost two thirds of its wetlands during the last 60 years it is surprising to notice that drainage works continue to be a threat to wetland areas. The most recent examples affecting Ramsar wetlands are in lake Vistonida where the authorised public works comprise flood control, land drainage and road works east of the lake and will cause the drainage of 320 – 400 ha of wetland area to the east of the lake. In Anthia, Evros delta, the local community has repeatedly tried to illegally drain a usually flooded area in the western part of the delta that is among others an important habitat for the Slender Billed Curlew. The regulation of the riverbeds with channels and dikes is also a common cause of wetland area modification although the majority of these works occurred during the decades of 1950 and 1960.

Regarding water regime, the most usual references concern increased water demand for irrigation. Schemes that involve the diversion of rivers (Acheloos), the building of dams and reservoirs (Nestos, Kerkini), drainage of lakes and marshes (lake Vistonida etc.), have resulted in major losses to freshwater ecosystems. Moreover, excessive abstraction for irrigation purposes has led to salinisation of the aquifers (e.g. in Kotychi) or of freshwater parts of the relevant wetland as in Axios deltas.

The construction of dams inside the wetlands or in their catchment area is also a factor of ecological change. Dams prevent the free flow of water and sediments that are important for the downstream delta and cut off the migration of aquatic organisms, e.g. fish. In Nestos delta, erosion has become more active than sedimentation. Nevertheless, the Greek Council of State approved the three successional dams upstream of Nestos, that depend on optimistic values of precipitation and

incoming water from Bulgaria and may easily lead to the periodical drainage of the delta. Both in Amvrakikos and in Mesolonghi the hydroelectric works upstream of the rivers have reduced the inflow of freshwater in the wetlands. The scheduled diversion of Acheloos is expected to cause more problems to the lagoons of Mesolonghi.

Although there do not seem to be frequent acute incidents, changes in the water quality in the Greek Ramsar wetlands is also an issue of special concern. One of the main problems in all the wetlands is nutrient, herbicide and pesticide run-off, of which there is only limited control. Intensification of agricultural methods and expansion of cultivated land compounds the problem. Effluent disposal is another reason for concern. There are still villages, like the communities around Prespa, and cities like Langadas in Koronia, that use the nearby wetlands as household sewage recipients without any treatment. In the large trans-boundary rivers such as Evros and Axios industrial pollution is also traced, generated mainly in the heavily industrialised areas of the neighbouring countries.

A dramatic example of acute ecological change is lake Koronia. The water quality of the lake was gradually degrading due to increased industrial effluent and agricultural run-off. The water quantity was also falling dramatically due to increased pumping for agricultural and industrial activities and a prolonged period of drought. The lowering of the water level increased the problem of pollution. Finally, the whole system collapsed in 1995. Massive fish mortality was followed by the death of many birds, especially ducks. The effect on wildlife was prolonged and a significant decrease is documented of the bird populations wintering in lake Koronia, like for example the rare Dalmatian Pelican. The fish population of the lake was drastically reduced and practically destroyed; it is probably no longer viable, leading to the subsequent decrease of the fish-eating bird populations.

All of the above have a direct influence on the wetlands' biodiversity. The higher dam of 1982 at lake Kerkini causes a 5m annual difference of water level. This has a negative result on the number and populations of the nesting bird species that see their nests flooding. The consequences also affect the fish fauna. The eel *Anguilla anguilla* disappeared because it could no longer pass the higher dam and the fish *Siluris glanis* is also extinct due to a loss of its sprawning grounds. In addition, the acute changes of water flow at Nestos river, due to irrigation needs, hinder the reproduction of amphibians that need slow running water. The endemic fish species *Alosa caspia vistonica* is believed to be recently extinct because of the increased salinity of lake Vistonida. At Kotychi lagoons, grazing and human pressure and salinisation of the aquifer obstruct the regeneration of the Umbrella pine. Other changes to biodiversity include the -hopefully- isolated introduction of alien species like the Mink (*Mustela vison*) and Tench (*Tinca tinca*) in the biotopes of Mikri Prespa.

It is difficult to separate the above causes of ecological change from the unsustainable use of resources or the inadequate management and even the negative attitude of local people. However the latter are usually translated in illegal human activities. Some examples include illegal and excessive hunting in almost all Greek Ramsar wetlands, sand extractions in Axios delta and in Kotychi, expansion of illegal settlements, grazing beyond the area's capacity in Evros, Axios and Ismarida and intensive agriculture as expressed by the bean monoculture of the Prespa area. Positive examples of course occur, such as the experimental reforestations of *Pinus pinea* at Kotychi and the riverine forest of Nestos or the limited biological cultivation of beans in Prespa.

Monitoring procedures

Most of the monitoring procedures are targeted to parameters that may influence financial activities but some of them can also be used for the ecological changes. For example the physico-chemical analyses and quality control of water, that are quite common, combined with the data collected on fish catch can lead to estimation of trends of fish population. Central and local authorities are in general involved, but to a different degree in every wetland and there is no organised pattern. The only common project is the "*Quality control and analyses of water from trans-boundary rivers in the prefecture of Thrace*" that is executed by the local Chemical Services and the Ministry of the Environment. Also, a national monitoring programme on water quality has started being implemented, since 1996, by the Ministry of the Environment. No regular reports are yet published and information can only by obtained from the central services of the Ministry of the Environment and upon specific request. The National Database of Hydrological and Meteorological information, which is expected to be launched in October 2000, will present all data on water quantity and will provide easy access to information to all interested parties - authorities and users.

Research institutes and NGOs are in general involved in a number of research and short term projects that monitor biological parameters. The Mid-winter Waterfowl Censuses should be mentioned, a long-term project on bird populations that covers all the Greek Ramsar wetlands and is organised every year for almost 2 decades by the Hellenic Ornithological Society, a Greek NGO. WWF-Greece, the Hellenic Ornithological Society and the Society for the Protection of Prespa have been systematically monitoring the populations of the Pygmy Cormorant and the Lesser White-fronted goose in Axios, Evros and Nestos deltas, and in the lakes Prespa, Kerkini, Ismarida, Vistonida and Porto Lagos, for a three-year period (1997-2000).

In wetlands in close proximity to universities there are usually some monitoring projects of water quality, like in the deltas of Axios-Loudias-Aliakmon and Nestos, or of vegetation and plant communities like in Kotychi lagoon. Even though these projects do not comprise long-term monitoring programmes in these few cases their results can be used as sufficient baseline data.

The data from the aforementioned projects are usually assessed by the services or organisations that collect them. Usually there is no assessment procedure for the monitoring programmes. It is also doubtful whether these data can be regarded as sufficient baseline data for a proper monitoring programme to rely upon. Quite often the sample is low and not all parameters are recorded or different services use different methods and the results are not comparable. Another difficulty is that, frequently, the exchange of information between central and local authorities, educational institutes and NGOs is sporadic and unsatisfactory.

HUMAN ACTIVITIES

Main wetland values

From the different natural functions of the wetlands rise specific values for the people. Quite often the concept of these two words is mixed since some functions benefit the users of the wetlands or people in general without further effort. According to this broader view, the main wetland functions and values recognised in the Greek Ramsar wetlands are presented in Table 2.

Table 2: Significance of wetland values and/or functions in the Greek Ramsar wetlands. **High**: considered high in 7-10 wetlands, **medium**: considered high in 4-6 wetlands, **Low**: considered high in 1-3 wetlands.

Value and/or function	**Significance**		
	High	Moderate	Low
Biodiversity	✓		
Water supply			✓
Irrigation		✓	
Groundwater Recharge	✓		
Water Purification		✓	
Flood Control		✓	
Erosion Control			✓
Financial (fishing, grazing, agriculture)	✓		
Energy Supply			✓
Salt Supply			✓
Sand Supply			✓
Aesthetic		✓	
Recreational		✓	
Scientific	✓		
Educational		✓	

These values and functions are presented in detail in the other paragraphs on main human activities and ecological changes.

It should be stressed that no specific studies have been done on the role of each Ramsar wetland on groundwater recharge, erosion and flood control, and water purification. The estimations presented are rather subjective and based on expected results and relevant bibliography.

Also the aesthetic, recreational, scientific and educational values were characterised as being of moderate significance based on the current number of people that actually benefit from them.

Main human activities

Agriculture is the principal human activity in the Greek Ramsar wetlands. In fact relation between these two is so strong that they should be addressed together in a common conservation strategy. Agriculture is an activity occurring both outside and inside the wetland areas. In many cases large areas of the wetlands have been completely changed due to extensive drainage works during the '60s for the expansion of agricultural land, like in Evros and Axios deltas. In fact inside the Axios delta there are extensive rice fields with yields amongst the highest in the world. Extensive networks consisting of channels, ditches and dikes modify the water flow and divert it from the natural systems for agriculture needs. In fact the ever-increasing demand for irrigation water causes a series of problems. Over-pumping has caused salinisation in Kotychi lagoons and lowering of the water level in lake Koronia.

The lack of co-ordination between the services responsible for irrigation schemes and those responsible for nature conservation is often striking. Lake Kerkini was threatened for years by, originally approved but pending, plans regarding the rise of the impoundment dikes. It is interesting to note that even people from the Ministry of the Environment were opposed to them. Finally, before the Ramsar COP7 -and under pressure from NGOs- it was decided that the alternative solutions (e.g. minimisation of losses of the existing irrigation system and relief of flooding water in old canals of the river) should be considered.

Non-point pervasive pollutants are another problem generated by agriculture to wetlands. This run-off stems from little knowledge on the correct use of fertilisers and pesticides and insufficient control and affects almost all water bodies.

Fishing is also an important activity in lagoons, deltas and lakes contributing to the income of local people. In the Axios delta, production of mussels and other molluscs is the highest in Greece. The lagoons are also extensively used as fisheries more or less intensively. In Amvrakikos gulf it is estimated that about 1,500 families depend directly or indirectly on fishing. Nevertheless, overfishing within the lagoons and in the coastal areas, illegal fishing, organic pollution, changes to hydrological status and loss of sprawning grounds, and urbanisation have lead to the decline of fish catches in the Greek wetlands. In 1981 it was estimated that the total yield of the lagoons was 2,000 tons, whereas today the total production of the 72 lagoon fisheries is 1,300 tons of fish per year. The mean fish production of Greek lagoons is 0.4-0.6 Kg/ha/year whereas in Italy this figure rises to 3-4 kg/ha/year. In Ismarida lake fish production has decreased 43% during the past 10-15 years according to data from the Prefectural Fisheries Department. Besides total production there are also changes to caught species and their commercial value as in the lake Vistonida where the rise in production was coupled by the shifting from high priced fish to low quality *Cephalus* sp.

Dredging works for the deepening of the lagoons and the easier circulation of water for fishing purposes has lead to the loss of significant shallow-water feeding grounds for birds like waders in the Nestos delta. Also the deposition of the dredged material around the lagoons has caused the degradation of the surrounding habitats, mainly salt marshes in almost all the lagoons of Thrace. The establishment of intensive aquaculture plants, with their accompanying earthworks, in natural lagoons has also caused serious problems of habitat alteration and organic pollution to the gulfs of Amvrakikos and Mesolonghi.

Another important and old practise in the Greek Ramsar wetlands is animal breeding and cattle raising. It is classified as having a high to moderate level of significance in all the Greek Ramsar wetlands except for lake Kerkini and Nestos delta where it is considered to have limited social value. The Evros delta and the adjacent meadows of Prespa support a significant number of cattle and sheep. Nevertheless the constant increase of cultivated land has greatly reduced the land that is available and free for grazing, as in Axios delta where only the riparian zone can be used as grassland. As a result the overall number of animals is stable or declining. Only in the lake Mikri Prespa the number of animals is rising, as is the cultivation of grass for cattle. During summer 1996 all animals (7,000-8,000) in the delta of Evros had to be slaughtered due to an epidemic of the foot and mouth disease. In winter 1999-2000 they numbered again 6,000 (3,000 cattle, 1,500 sheep and 1,700 goats).

Animal breeding is practised in all the wetlands in an irrational way that results in increased pressure to the wetlands and overgrazing. There are no range management studies that would estimate the carrying capacity of grazing animals and regulate their number. Only in Evros delta has such a study started but its specifications do not take into account the special needs of the wetland, and the results have not been implemented yet. The expansion of livestock facilities is generally prohibited inside the protected areas according to the relevant Joint Ministerial Decisions, but these regulations are not always respected. An example of this is the Kotychi lagoon where there is a decision pending since 1993 for the removal of livestock from the Ramsar area. Nevertheless about 15 families still continue their activities. Overgrazing in the riparian zones results in clearing of the vegetation, since these are rather restricted areas, and altering of the species composition. Since the animals especially favour these areas, because they provide shade and water during summer and protection during winter, pressure is increased. Controlled grazing on the other hand may be beneficiary to the wildlife. It may increase diversity as is the case of Prespa where the prohibition of human activities, including animal grazing, led to the transformation of wet meadows to reed beds altering species diversity and leading to the disappearance or decline of certain species of birds and fish.

Hunting is an activity that although it does not have a commercial value is very common in all the Greek Ramsar wetlands, causing very serious problems and disturbance to ornithofauna. It is also the most common example given by the respondents regarding unsustainable use of wetland resources. With the exception of lake Kerkini, where there are only few isolated incidents of illegal hunting around the wetland, all other sites have repeated cases. For example in the Evros delta hunting is considered one of the main reasons for the reduction of waterfowl. The limited personnel of the Forestry Service, which is responsible for the guarding of the wetlands, is not enough to

control the usually large wetland areas. Moreover most important bird habitats are easily accessed. According to data from the Ministry of Agriculture, during 1998, 237,837 hunting licenses were issued in Greece of a total value of over 2 billion drachmas.

Tourism is a developing activity within and around wetlands. Although now characterised as of moderate to low impact it is expected to rise in significance in the coming years. The infrastructure regarding Information Centres and the development of projects regarding the attraction, reception and information of visitors is estimated to increase the number of eco-tourists. Presently tourism and recreational activities are developing arbitrarily, without an integrated specific plan. As such these are growing threats. Tourists trying to photograph nesting birds cause disturbance in lake Prespa and in Evros delta; water-ski exhibitions were recently organised in lake Volvi without any kind of environmental impact study. Also a lot of the illegal settlements reported from many Greek Ramsar wetlands refer to holiday resorts. More detailed data on number of visitors can be found in the last chapter of this report.

Forestry is another human activity that should be mentioned. It is significant in the lakes Mikri Prespa and Kerkini. It includes legal and illegal logging as well as poplar plantations in Kerkini.

Finally the salinas of Mesolonghi produce 80% of the total Greek salt production.

Monitoring procedures

The parameters and information collected vary from place to place. Several central and local authorities collect data on agriculture, cattle grazing, fishing, and other financial activities. However, since usually the purpose of these studies is not a systematic monitoring of the trends in human activities, the results may not be reliable or they may need a different compilation. Also several research projects include the monitoring of certain parameters for a limited period of time.

The most commonly gathered data seem to be the water quality and water physiochemical parameters. The Prefectural Agricultural Services generally keep data on farming (e.g. number of animals, annual differences in stock population in Axios, Kerkini and Prespa), number and capacity of aquaculture units in Axios delta, and sometimes on agriculture (e.g. in lake Prespa). The responsible Fishing Departments usually keep data on fish catch.

In addition, a lack of communication is occasionally noted between the various civil services and the Joint Committees of the Programme Agreements that are supposed to act as Preliminary Management Schemes.

The non-governmental organisations are also involved in assessing human activities. One of the most long-standing assessments was the Red Alert Programme, undertaken by WWF-Greece from 1990 to 1997. This programme was designed to protect and monitor the deltas of Axios-Loudias-Aliakmon and Evros. Its objectives were to prevent further degradation through collaboration with local authorities. Scientists permanently established in the areas monitored every activity with a potential negative influence on the wetlands and informed accordingly the responsible services about the direct or indirect dangers.

Also in the Life-Nature II programme "Conservation of *Phalacrocorax pygmaeus* and *Anser erythropus*" WWF-Greece, the Hellenic Ornithological Society, and the Society for the Protection of Prespa were involved in a similar procedure in ten Greek wetlands (including 6 Ramsar ones). The project has included monitoring of frequency of illegal activities and of impacts from human activities pertaining to the use of land and water resources. This project was completed in February 2000.

Big construction projects

There are a number of big construction projects planned to take place in the Greek Ramsar wetlands. Relevant Environmental Impact Assessments (EIAs) have been elaborated. Some of the projects affect more than one wetland, such as the construction of the "Via Egnatia" motorway that will pass through the sites of Koronia & Volvi and Nestos delta. Another conflicting example is the water of Aliakmonas. In the delta of Axios-Loudias-Aliakmonas there are plans for the diversion of part of the Aliakmonas river for the irrigation of the Thessaloniki plain and the supply of drinking water to the town of Thessaloniki. For this project there is an EIA. On the same time there is a project proposal regarding the transfer of water from Aliakmonas to lake Koronia. The river lies outside Koronia's watershed basin and is part of another Ramsar site. Negative opinions have been expressed and there is no EIA yet.

In the lake Kerkini, the only big construction project refers to the raising of the impoundment dikes. It was cancelled before the Ramsar COP7 because of the negative results that it would have for the wetland and in view of alternative low impact solutions.

The Programme Agreements have also included a number of projects like the rehabilitation of the Drana lagoon on Evros delta, or the construction of a thematic Information Centre in Prespa. These are usually important at the local level. There are also a number of proposals from local authorities that have been agreed on but for which there is no EIA yet.

Wise use and conservation of wetlands however requires management on a catchment area basis. Therefore we should mention the unfortunate examples of works, especially big construction ones, that are not scheduled according to this broader principle and result in serious damages for related upstream or downstream wetlands. A characteristic example is the diversion of Acheloos river to the plain of Thessaly for irrigation purposes: the largest, most ambitious and environmentally damaging work ever conceived in Greece.

Diversion of Acheloos River

Five Greek NGOs, WWF-Greece, the Hellenic Ornithological Society (HOS), Elliniki Etairia, the Hellenic Society for the Protection of Nature and Nea Ecologia initiated a joint campaign against the project and have demonstrated the environmentally, financially and socially irrational character of the project. The arguments against the Acheloos diversion include its detrimental environmental impact on 4 pSCIs, including one Ramsar site and one SPA; the fact that it does not consider that under the reformed CAP and Agenda 2000 Greece is required to significantly reduce its production in high

yield crops such as cotton; its cost being greater than the benefits expected from it; the suspension of EU funding through the 2nd Community Support Framework following international pressure from the NGOs and the WWF network; the negative project's impact on the economy and culture of the mountainous communities of S.Pindus. The diversion of the flow of the upper Acheloos to Thessaly is an example of a long gone development model that bolsters ostentatious and impressive undertakings.

The first application for the cancellation of the works was submitted in 1993 and was examined and upheld by the Greek Council of State in 1994. However, works were not suspended. Instead, the Ministry of the Environment announced the modification of the scheme for the implementation of the "small" or "ecological diversion". According to the new plan, the annual diverted water quantity will be 600 million m^3 instead of 1.1 billion. The dimensions of the dams and tunnels, though, have remained unchanged.

The second application for cancellation of works for the diversion of Acheloos River was submitted by the NGOs in 1995 and heard at the Greek Council of State on November 12, 1999. The case was heard by the plenary of the Greek Council of State and was treated as an issue of national importance. The councilor's report to the plenary recommended that the application of the NGOs be accepted since the state has not examined alternative sites for the construction of the dam of Sykia. Decision was announced, in November 2000, stating that the decisions of the Ministries of Environment and Culture which grant approval to the construction project are illegal. The Greek Council of State concluded that the national authorities failed to examine alternatives in order to avoid impacts on the natural and cultural heritage of the affected area.

The decision, however, to stop or proceed with the diversion scheme is a political one. An integrated re-examination of the rationale of the diversion is not within the competence of the Greek Council of State. Diversion works are progressing, although at a slower pace. In early 1999, WWF-Greece and the HOS submitted to the European Commission a complaint against the Greek Government for causing irreversible damage to 4 sites included in the national Natura 2000 list. International publicity and pressure put directly on the government is an effective means of keeping Acheloos at the top ten list of the Greek government's agenda of problems to solve.

The reduction of the flow of Acheloos River to its delta will directly influence the Messolonghi lagoons and Aetoliko lagoons and the estuaries of Evinos River. Consequently, the balance between fresh and salt water will be severely disturbed, thus causing salinisation of the soils. The related freshwater habitats will also be impacted by reduced silt deposition. Furthermore, the ground water levels will be raised or lowered in different areas, thus affecting water supply and forest production.

Source: Theodota Nantsou, WWF-Greece

Organised groups of stakeholders

In most cases there are some active co-operatives as well as stakeholders' associations. Their activities aim at their own professional interests often ignoring -and even at the expense of- he wise use of the wetland. A characteristic example is the case of Prespa where the outflow of water from

the lake Mikri Prespa to Megali Prespa is controlled by the farmers through the Land Improvement Service. The desirable water level for the farmers prohibits the surrounding fields from flooding but does not take into account natural vegetation of wet meadows and the ecological needs of an area that belongs to the core area of the National Park.

All these associations would participate in the Advisory Committees of the relative Programme Agreements (see chapter on Management) together with NGOs and other interested groups. However these Committees had no decisive authority and as a result their implication in the organised management of the wetlands was minimal.

MANAGEMENT

A management plan is essential if we are to proceed in a rational way of description and assessment of values, setting of goals, definition and implementation of appropriate management measures and periodical reviews. In the "Guidelines on Management Planning for Ramsar sites and other wetlands" (1993), it is emphasised that "…management planning is a way of thinking which involves recording, evaluating and planning. It is a process subject to constant review and revision. Management plans should therefore be regarded as flexible, dynamic documents".

In general a management plan is divided into the following major sections:

Description	Presentation of the current situation, identification of gaps and provision of the basis on which management decisions can be taken.
Recognition	Recognition of past modifications and of possible threats to the site (some consider recognition as part of the evaluation).
Evaluation	Evaluation of the most important wetland values and threats.
Objectives	Formulation of short (operational) and long-term (ideal) objectives
Action Plan	Formulation of necessary management actions in order to achieve the objectives set.

Monitoring is an integral part of the planning process. The management plan should also be subject to reviews. Short-term reviews confirm that the site is managed according to the plan. Long-term reviews are undertaken in order to amend and update, if necessary, the action plan and ensure that the objectives are still relevant.

Management Plan

Management specifications for the Greek Ramsar wetlands, as well as for protected areas in general, are included in two types of documents:

The *Specific Environmental Studies (SES)* which should lead to draft Presidential Decrees. These studies are supposed to formulate management objectives for each site, as well as document and propose the need for specific projects, regulations, land uses and protection zones. The Presidential Decrees will include specific operation and management guidelines and prescribe a management programme. The Specific Environmental Studies are prepared by external collaborators and supervised by a Joint Committee formed by representatives of the Ministry of the Environment and the pertinent regions. These SESs are still under preparation (most submitted for approval) for all of the Greek Ramsar sites.

Before the completion of the Specific Environmental Studies, *Joint Ministerial Decisions (JMD)* are issued in order to define zones, management objectives, land uses and permitted human activities in each zone. The way that these activities will be practised is roughly outlined. This legal

administrative tool is valid for 2-3 years maximum. The JMDs must then be followed and replaced by Presidential Decrees, which have a permanent status.

Joint Ministerial Decisions have been issued for 8 Ramsar sites. In the lake Mikri Prespa a Management plan has been drafted since 1989 but has not been ratified yet (!) and in the lakes Koronia & Volvi the JMD has been prepared but not yet signed by three out of the five responsible ministries. With the exception of the deltas of Evros, and Axios-Loudias-Aliakmon all the other JMDs have expired. In theory, the boundaries and regulations defined in the Joint Ministerial Decisions are regarded as valid even after their expiration and until the issuing of the relevant Presidential Decrees. To this effect there is also the example of the decision of the Greek Council of State against the appeal of permission for the installation of a ship-dismantling unit within the protected area of the Nestos delta. Also for the lake Kerkini there is a standing decision renewing the validity of the Joint Ministerial Decision until the enforcement of the Presidential Decree. Nevertheless many people, authorities included (e.g. in Kotychi) question the validity of the JMD regulations.

In view of the aforementioned Presidential Decrees the State decided the creation of the so-called "Preliminary Management Schemes". This name actually stands for the Joint Committees established in 1997 in the Greek Ramsar wetlands as the responsible bodies for the implementation of the Programme Agreements (PAs – see following box). They consisted of representatives of the contracting parties (neighbouring municipalities and communities, the local prefecture, and the Ministries of Environment and Agriculture). These committees should meet at least once in every three months and receive administrative and secretarial assistance by Local Development Institutions. The Ministry of the Environment has considered these "Preliminary Management Schemes" as having a three-fold aim:

- To respond quicker to the matters that arise concerning the every day management problems of the sites
- To carry out projects concerning awareness, infrastructure, monitoring and management
- To co-ordinate relevant authorities in working out further priorities for the management of the sites

Nevertheless, the Joint Committees cannot be regarded to have functioned as "management schemes". There has been no management plan and the Programme Agreements have included only fragmentary actions with no integrated approach. The Joint Committees were not consulted in advance for many of the scheduled measures and they could not make any decisions on new arising problems since they were not financially independent. They could only acknowledge that certain measures that were already scheduled for each Ramsar wetland were duly executed.

Programme Agreements

Programme Agreements were signed for the 10 Greek Ramsar wetlands and another 23 wetlands by the Ministry of the Environment, the Prefectural and Peripheral authorities, and the surrounding communities. Their purpose was to implement priority conservation measures, to operate the Information Centres, and to organise public awareness and sensitisation projects and activities.

The Programme Agreements were an innovative institution that demanded the collaboration of many different authorities, central and local, each with a narrow sectoral approach. This resulted in a lot of organisational problems and the Programme Agreements got trapped in bureaucratic deficiencies, inadequate management and lack of co-operation between the various authorities involved. As a result, progress in scheduled projects was slow and the absorbing rate of the available funds very low. Finally, a significant number of scheduled measures like in the deltas of Axios and Evros and in the lakes Koronia & Volvi were postponed or even cancelled. In other cases the available funds have been enough only for the elaboration of the relevant study and not for the implementation of the project itself.

The Programme Agreements expired in December 1999 and were postponed until June 2000. Funding was not any more available and their main objective was to prolong the operation of the Information Centres. This has been a temporary solution to be replaced by the establishment of the management bodies, which however are not foreseen for another 1-2 years, in the most optimistic cases. It is apparent that another solution should be sought for in the meantime in order for the Information Centres to remain functional and not waste the expertise gathered during the last two years.

It is clear from the above, that established permanent management plans and bodies have not yet been created for any of the Greek Ramsar wetlands.

Effectiveness of Management

All respondents agree that the management of the Greek Ramsar wetlands is neither effective nor efficient, primarily because there is no management plan or overseeing body. The management specifications described in the previous section cannot serve as documents replacing an operative management plan. They are too general, whereas much more detailed management procedures and objectives are required in order to address human activities in protected areas. There is also a need for a different, integrated, approach concerning the implementation of management guidelines. Both existing documents -the Specific Environmental Studies and the regulations of the Joint Ministerial decisions- remain rather sectoral instead of aiming at the conservation of the whole wetland areas.

There is also the need for increased public awareness and the development of local groups actively interested and participating in the conservation and wise use of the wetland. These groups (locally active NGOs for example) may also act as pressure points for the implementation of the management regulations. The lack of sensitised people seems to be more apparent in areas like the Amvrakikos gulf and the lagoons of Mesolonghi and Kotychi where there has not been a continuous and long-term involvement of NGOs.

Zoning system

A zoning system has been proposed for all the Ramsar wetlands and is described in the relevant Joint Ministerial Decisions. According to these plans, in the majority of the sites the most important and sensitive parts of the wetland are included in the zone of higher protection. These plans include rough management guidelines that control human access to very sensitive areas, describe prohibited and permitted activities, and define rules for their exercise.

Usually there are up to three zones of varying degree of protection (4 in Mesolonghi). The outer one functions as a buffer zone but it does not extend to cover the whole watershed. There is no common description of the permitted activities since these have been defined according to the existing land uses.

The proposed zonation is generally well received by the respondents. There are however some problems with the boundaries set: For example, in the lake Mikri Prespa the zoning system was set in 1974, when the area was declared a National Park, and is restricted to a core area and its surrounding zone. The core area includes all Mikri Prespa, reedbeds, wet meadows and some land area. A long needed revision is still under preparation in the Specific Environmental Study. In the Evros delta there are two sets defined: Zones I, II, and III comprise the Ramsar site and are also proposed Natura 2000 sites. The second group consists of 5 zones (A, B, C, D, and E). Out of them the zones C, D and E include important riverine formations and meadows of high biological value that should be included in the proposed Site of Community Importance (pSCI) in order for the delimitation of the area to be satisfactory and functional. Finally, in the site of lake Vistonida and Porto Lagos lagoon, the lagoon of Porto Lagos is not included in the strictly protected zone A and consequently is not a SPA.

The main problem of the proposed protection zones is that the management regulations included are rather rough and general, as the Joint Ministerial Decisions are not detailed and are not fully enforced in all the Greek Ramsar wetlands.

Wardening

The wardening of the protected areas is unanimously characterised as insufficient in all the Greek Ramsar wetlands. The degree of the gravity of the problem varies between the sites.

In general wardening is facilitated:

- By the Forestry service that carries the main responsibility, since it is supposed to develop a specific scheme for the wardening of the relevant protected area. Nevertheless, the Forestry

Service operates on extremely limited funds and resources -including personnel- and usually inadequate equipment. Furthermore, the personnel of the service have a lot of other responsibilities. So usually they are mainly involved with illegal hunting control.

- By the wardens-eco guides employed via the Programme Agreements. In most cases they are also inadequately equipped. For example, in Axios-Loudias-Aliakmon delta they have no vehicle to monitor the area. Furthermore, when these wardens spot an illegal activity they are not allowed to proceed to arrests or apply sanctions but can only press charges at the relevant authorities (police or forestry service). Their presence is supposed to prevent or act against violators by persuasion and suppression, but this often does not correspond to reality and largely relies on the good will of people.

Occasionally, the local Hunting Societies are also employing wardens who again are not licensed to arrest poachers. Therefore, they are usually patrolling the area together with somebody from the forestry service.

Another deficiency of the wardening system, not only in the Ramsar wetlands but also in every protected area in Greece, is once more that it is not integrated. Different authorities/services are responsible for different activities and in some cases (such as the building of illegal settlements) more than one services are required to verify the violation, press charges, decide for the removal of the establishment and finally apply the decisions.

Restoration and rehabilitation projects

The Greek Ramsar wetlands are in a relatively good state and there is no urgent need for large-scale restoration and rehabilitation projects.

Lake Koronia is a striking exception. After the collapse of the system of the lake Koronia, the authorities of the Region of Central Macedonia have carried out a Master Plan for its rehabilitation. It includes a number of projects and measures. The first one concerns the transfer of water from river Aliakmon to lake Koronia. It aims to supply water to the lake by a river outside its catchment basin. The project is very controversial as it may have impacts on two Ramsar sites (River Aliakmon forms the Aliakmon delta which is part of another Ramsar site). Negative opinions are being expressed by NGOs as well as engineer organisations. The second project concerns the diversion of two torrents in order to supply water to Koronia. This project is also controversial, as it is believed that it will have impacts on lake Volvi. Finally, there is an agri-environment scheme that aims mainly to the reduction of the water used for irrigation and to habitat creation. Responsible for these projects is the Prefecture of Thessaloniki.

In Evros delta, the restoration of Drana lagoon is another long standing and needed project. The lagoon stretched over an area of approximately 400ha northwestern of the Evros river mouth. Before its drainage it encompassed an open salt-water area, about 10 islets with halophytic vegetation in its interior, and flat saline expanses with no vegetation along its outskirts. It comprised a most significant habitat for the delta's ornithofauna throughout the year. It was drained in 1987 because it was thought that it contributed to the salinisation process of the surrounding agricultural land. It was probably one of the most serious changes in the Evros delta and significantly reduced its

ornithological importance. It also had negative financial results as it destroyed its fishing potential that could have resulted in significant profit. On the other hand the quality of the surrounding fields did not improve.

Technical proposals for the restoration of the lagoon were submitted by WWF-Greece in 1995 and eventually funding was secured by the Prefectural services. Its execution however is delaying for no apparent reason bearing in mind that the local communities, that originally demanded and initiated the draining, are now in favour of the project.

On a pilot scale, a number of experimental restoration projects have been implemented within the framework of the LIFE Nature II project "Conservation of the pygmy cormorant and the lesser white fronted goose in Greece"[7]. These consist of:

- The creation of a series of three ponds in the flood bed of Axios river, the deepening and clearing of a drainage ditch in the same area and the flooding of an area in Evros delta during summer months, in order to increase the fresh water habitats in these wetlands.
- The construction of an artificial islet in the lake Kerkini. It is expected to help the nesting species as the islet's raised level will protect the nests from flooding during spring when the dam is closing and the water level is raising quickly and more than 5 meters.
- The planting of trees in Axios delta, Evros delta, lake Kerkini and Porto Lagos in order to restore and increase riverine formations and riparian forests.

In addition, the Society for the Protection of Prespa together with the University of Thessaloniki, the Tour du Valat institution and partial funding from Life-Nature is executing a project for the restoration of the wet meadows around lake Mikri Prespa to their former importance, by reinstating the seasonally flooded grassland within the core of the protected area. The wet meadows were decreasing due to the landward expansion of reeds with negative results on bird and fish populations (e.g. decrease of herons and carps, extinction of spoonbill).

Finally, two projects for the restoration of the riparian woods of Apollonia and of river Rihio, which included fencing and tree plantations, have been implemented within the context of the Programme Agreement for the lakes Koronia and Volvi.

[7] WWF-Greece is the beneficiary of the project that is executed in ten Greek wetlands with the collaboration of the Hellenic Ornithological Society and the Society for the Protection of Prespa.

ACTIONS TO INCREASE AWARENESS OF WETLANDS AND THEIR VALUE AND PARTICIPATION OF LOCAL POPULATION

Non-governmental organisations acting locally

On the whole in every Greek Ramsar wetland there is at least one non-governmental organisation with local actions. The number and type of these actions though varies very much. Locally based NGOs are usually small and active in the field of awareness. They also contribute to the monitoring of illegal actions but not in a systematic way. Some of them have been quite active and successful, like the Environmental Awareness and Ecotourism Centre of Aitolia and the Environmental Society of Preveza, but were forced to minimise their activities due to lack of funds and people.

An important exception is the Society for the Protection of Prespa that for the past 8 years has been contributing actively and significantly to the conservation of Prespa.

WWF-Greece is a national NGO with important local action in the deltas of Axios and Evros. Its activities include also the Prespa area and untill some years ago the area of Amvrakikos. Another national NGO with local activities in Ramsar wetlands is the Hellenic Ornithological Society (HOS). It has been active in almost all Ramsar sites and it organises every year the Midwinter Waterfowl Censuses. Details on the activities of these two NGOs have been presented in previous paragraphs regarding monitoring procedures. In the lakes Koronia & Volvi another national NGO, the Hellenic Society for the Protection of the Environment and Cultural Heritage, is also active. All these organisations are based in Athens and also have offices either locally or in Thessaloniki.

WWF-Greece and the Hellenic Ornithological Society have participated in the Programme Agreements as technical advisors of the local Development Companies. They have also been members of the Advisory Committees together with the local NGOs and have in some cases contributed to the training of the personnel of the Information Centres. HOS also prepared communication material for some of the Centres (e.g. in Kotychi and the lakes Koronia & Volvi).

Participation of local communities in the conservation and wise use of the site

The involvement of local communities to the conservation of the wetlands started with the Programme Agreements that directly implicated the local authorities and the local communities they represent, in the management and the protection of the respective wetlands.

Besides the Programme Agreements the actions to increase the participation of local communities in the conservation and wise use of the wetlands have been limited and isolated. They mainly included seminars to local authorities and public awareness projects. One of the most organised ones was the MedWet-Acnat programme (1992-1995). The lakes Koronia & Volvi and the lake Kerkini had been selected as Greek test sites within the framework of the sub-project “Information and public awareness”. The main aim was to find how to increase the appreciation of a wetland’s multiple values and show that in order to maintain them attitudes and uses must change. It was recognised that in the MedWet areas communication among the parties was increased and the proper climate was created for the establishment of a local management body. On national level,

three seminars were organised on wetland issues for managers of administrative and managerial level.

Special reference must be made to the case of the lake Mikri Prespa and the activities of the Society for the Protection of Prespa (SPP). Since its foundation, in 1991, SPP encourages the active participation of the lake's surrounding communities to the wise use of the wetland. Amongst them we can mention environmental education projects for the local schools, provision of technical assistance to farmers, organisation of organic farms and promotion of trading of traditional products of Prespa. In 1999 SPP was awarded with the Ramsar award for its pioneer approach to wetland management and co-operation at local, national and international levels for the sustainable management of a Ramsar site. This role was once more proved with the initiative of SPP to propose the establishment of Prespa as the first trans-boundary protected area in the Balkans (Declaration of the three Prime Ministers of Albania, Greece & FYR of Macedonia on February 2, 2000, Annex II).

Involvement of individual local people in the conservation and wise use of the site

In general no specific actions aiming to increase the involvement of individual local people have been initiated. The only exceptions mentioned in the questionnaires are basically guarding actions organised by NGOs. In Prespa, all the activities of the Society for the Protection of Prespa are carried out under the responsibility of scientists living permanently in the area and by local people who have been trained by the SPP. In Amvrakikos, the local fishermen co-operative was involved in the wardening of the Dalmatian Pelican colony. In the delta of Evros, WWF-Greece organised wardening volunteer groups.

A different and promising action is reported from the lakes Koronia & Volvi. In the context of the PA a conference was organised on "Agriculture and Environment" aiming to inform the farmers on the environmental impacts of agriculture, the new agri-environmental and rural development policies, initiatives and incentives and to stimulate action towards this direction. This conference lead to fruitful discussions and the farmers committed themselves to return with specific proposals and work closely with the Information Centre's project team.

An indirect involvement of individual local people in the conservation and wise use of the wetland is the fact that the personnel of the newly established Information Centres are local people.

Involvement of the private sector in the conservation and wise use of the site

Only two positive answers are recorded:

- A private firm (based at Thessaloniki) has undertaken the management of a 136ha area located in the flood bed of Axios river (within the protected area, zone A) receiving funds for this purpose from the Agro Environmental Regulation 2078/92. Management measures applied include removal of animal grazing from the area, wardening and fencing the area, management measures for the vegetation of the area as well as the development of educational and recreational activities.

- The engineer who undertook the dredging works in the lagoons of Porto Lagos, Lafra and Lafrouda used the dredging material for the creation of artificial islets that will encourage the nesting of colonial waterbirds.

Information Centres

Information Centres had been constructed in the Ramsar wetlands since 1994 with funding from several sources and programmes. Some equipment was also provided. However they were never fully operative and some of them eventually closed. The Information Centre in Amvrakikos operates since 1996 and in the lake Mikri Prespa since 1992 but through an NGO initiative. The Programme Agreements provided for the hiring of competent personnel and the completion of infrastructure for 8 Information Centres in order to be fully operational. The initial contract of the centres was for 24 months (1997 – 1999). Their majority started operating after September 1997.

The operation of these newly founded Information Centres concentrated to the following activities:

- Monitoring of the implementation of the Joint Ministerial Decisions, and of the potentially harmful to the site activities. They also provided support and co-ordination of the competent authorities
- Environmental education and public awareness actions
- Planning and implementation of projects for the attraction, reception, information and guiding of the visitors in the Information Centre[8] and in the protected area. Educational guided tours to schools and groups of visitors
- Publication of information material, production of video-tapes and other audio-visual systems for the promotion of the site and production of a quarterly newsletter
- The organisation of workshops on specific management issues of the site

The range of activities of the Information Centres depended very much on the available resources (staff and funds). A common problem faced by almost all centres was the cash flow from the Ministry that was irregular and prevented both the planning and the organisation of activities, thus resulting to their postponement or even cancellation. For example, the exhibition was not put up in all Centres on time, while in the Centre of Axios the foreseen vehicle for monitoring the wetland was delivered but never used due to bureaucratic problems.

The contracts of most Information Centres have expired since December 1999 and in most cases were at least informally renewed until June 2000. Presently, the Information Centres are not fully operating, while in most cases the personnel is being working for the last few months with no secured funding. Nevertheless, there are no specific plans or resources for the continuation of their operation especially so for the meantime period until the establishment of the local management bodies.

The Information Centre in Prespa was established in 1992 by the Society for the Protection of Prespa (SPP). It was the first Information Centre that operated in Greece inside a National Park. It

[8] An exhibition on the main features and values of each site operates within each centre. The Information Centres also support guided tours to the wetlands with eco-guides that also serve as wardens.

contains a permanent exhibition describing the main features and the values of Prespa. In 1995 SPP opened a second Information centre dedicated to the fisheries and fish of Prespa. At both centres environmental education and training programmes are held and publications developed. The operation of both centres is entrusted to young people of the area, especially trained for this task.

Attraction to the public

The public is attracted to the Greek Ramsar wetlands for a number of different reasons. Environmental education programmes and nature observation are the commonest.

Environmental education programmes include organised schoolchildren visits to the Information Centres. During the environmental projects of SPP more than 25,000 children from all over Greece have visited Prespa. In the delta of Axios it is estimated that about 500 people/month participate in such projects. The interest of the teachers is significant; almost 2,000 children visited the Information Centre of Koronia & Volvi during the first academic year of its operation.

Nature observation mainly refers to birdwatching. This form of tourism is more common among foreigners that visit the Greek wetlands especially during spring migration. In their majority the visitors come from western and northern Europe (mainly England, Belgium and Germany) and tour the wetlands of Thrace. Such activities attract about 1,000 –1,600 visitors per year in Evros delta. Quite often their visits are organised by specialised tourist agents, mainly from abroad. However, there is a growing number of Greek birdwatchers. Unfortunately there is a general lack of specialised material (like field quides) in Greek, especially regarding taxa other than birds.

General recreation is also common and may include one-day or weekend visits by small groups and families, mainly Greeks. This kind of tourism is not organised but there is a growing market for recreational and hosting facilities. This may lead to problems, such as in lake Volvi where there are proposals for boat tours or in Axios delta where there is an increasing number of illegally built taverns. Kotychi seems to be one of the most visited Greek wetlands during summer due to the long and sandy beaches of the area and the easily accessible near-by *Pinus pinea* forest.

Ecotourism and in general low-impact tourist activities have started to develop in a number of wetlands. The beauty of the surrounding scenery and the diversity of fauna and flora attract a constantly growing number of people. Where the corresponding infrastructure exists (i.e. guesthouses, guided tours, fully operative Information Centres), like in the lakes Mikri Prespa and Kerkini, the number of visitors rises above 15,000 – 20,000/year, and involves mainly Greeks. The estimated carrying capacity of Amvrakikos gulf may well exceed 200,000 visitors per year under proper control and development of receiving and information infrastructure.

The increasing interest on this type of tourism calls for the elaboration of similar studies as well as an organised framework (i.e. restriction of access to more sensitive parts) in order for this type of tourism not to exceed the receiving capacity of both the wetland and the reception facilities.

CONCLUSIONS

The purpose of this study was to describe, and more importantly assess, the conservation status of the Greek Ramsar wetlands. This encompasses the following:

- Identifying the major ecological changes that have recently occurred in the Greek Ramsar wetlands
- Describing and evaluating the main human activities practised in the wetlands and which directly or indirectly influence the freshwater habitats and may pose a threat
- Describing the activities related to the management of the Greek Ramsar wetlands, such as administrative measures (i.e. zoning), existence of responsible bodies and management plans
- Presenting the major activities for public awareness and the participation of local communities in the conservation and management of the wetlands and their natural resources

The results indicate that Greek Ramsar wetlands encounter common problems that mainly stem from the lack of sufficient management. Nowhere do we find an organised management body and a complete, coherent and functional management plan. Therefore there is actually no meaning in discussing any aspect on the quality of management.

Major constraints to the formulation and effective implementation of management plans

The primary constraint to the formulation and effective implementation of management plans is the lack of legally validated and permanent management bodies responsible for the conservation and wise use of the Greek protected areas (Ramsar wetlands included). The reluctance and lack of political will, both at a national and at a local level, have played an important role as well. The institutional deficiencies and the gaps in the legal framework concerning protected areas[9] (especially concerning the operation of management authorities responsible for the management and administration of protected areas) have been recognised for more than 10 years. The Ministry of the Environment, after many years of studies and pilot projects, has only recently (and after the compilation of the questionnaires) concluded on the organisational structure for such a body.

The aforementioned lack of political will, at both national and local level, should also be combined with the opposition from the local communities and stakeholders; especially so when these have not been properly informed on the particularities and advantages of their home area being declared protected.

A positive step is the long waited elaboration of a Master Plan for the Natural Environment that has been developed by a private firm on behalf of the Ministry of the Environment. Its main targets include the:

- Integrated protection, management and organisation of the Natura 2000 sites

[9] Law 1650/86

- Integrated management of protected fauna and flora species and of habitats
- Integrated protection and conservation of forests, important ecosystems and areas of natural beauty
- Protection of soils from erosion and desertification and of freshwater from salinisation

In order to achieve these targets, the Master Plan focuses on the elaboration, organisation and management of a National System of Protected Areas, on the protection and conservation of flora and fauna species, and on special management problems of the natural environment. A prerequisite for all of the above is once again the establishment of management bodies and the above mentioned Master Plan can be perceived as a definite move towards their establishment.

Indeed, the newly approved law 2742/99 allows for the formation of private management bodies (following a specific procedure), something that could not happen under previous legislation. This status is expected to allow for more flexibility of operation. It also includes specific provisions on the funding, the composition of the management body and its board, including the participation of NGOs within this.

However problems are still foreseen. For example, even though wardening is -according to the almost unanimous agreement of all the respondents- insufficient, it is doubtful whether the new management bodies will be able to effectively address this problem. The management bodies, due to their private legal status, will not be able to impose fines or take on a 'policing' role. This will have to be done through existing, but in general under-staffed and ill-equipped structures (Forestry Service etc.).

Another significant drawback to the proper management of protected wetlands arises from the structure of the public services. The fragmented and sectoral allocation of responsibilities among the different authorities prevents an integrated approach of management. The law makes an effort to resolve the issue of conflicting or overlapping responsibilities between Ministries and services but it still does not entirely clarify the role of each.

There is also no definite plan on the financial sustainability of the management bodies that will be established. Presently, Greece has proposed 52 Special Protection Areas (SPAs) and 264 Sites of Community Interest (SCIs) to be included in the ecological network Natura 2000. Even after the grouping foreseen for neighbouring or small areas, there will still be a significant number of such bodies. The Ramsar wetlands are considered as a priority in this list. If their work will be the active conservation and management of the human activities in the protected areas, these bodies should eventually become largely independent from government funding and must seek to secure financial autonomy, in order to effectively play their role on a long-term basis.

In addition to the administrational problems for the establishment of management bodies, there are also other constraints to the preparation and implementation of integrated management plans. These include among others, the poor planning on national and local level, the extremely restricted funding and the lack of sufficient baseline data. These will be immediate problems to the management bodies and their solution depends once more on political will. The selection for these

bodies of people with relevant knowledge and the commitment for adequate funding, at least for the beginning of their operation, are crucial.

The conservation and management of protected areas is currently a rapidly evolving issue of high importance. Wetlands, being dynamic ecosystems that are at an interface between terrestrial and aquatic environments, are complex and sensitive to changes and more often than not increasingly require management in order to maintain their great ecological, social and economic value. Changes affect not only the wetland area itself but also large parts of their surrounding catchment area.

There is a growing understanding among environmentalists and economists on the significance and value of wetlands for both the natural environment and the greater public interest. In Greece, the need for integrated management that will address the desires of the communities that live and depend on the Ramsar wetlands (that include the biggest and from a number of aspects the most important Greek ones) in ways that maintain their biological and cultural values is apparent, and in some cases urgent. WWF-Greece hopes that this report will be a useful tool that will assist in the development of all the necessary actions.

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ANNEX I

Questionnaire

In the following questionnaire the term “wetland area” refers to a unit comprised by the actual wetland (as defined by the ramsar criteria) and its wider surroundings. We neither restrict ourselves to the water-covered area, nor do we extend our assessment to cover the management and the ecological status of the whole wetland’s catchment area.

1. Site description

1.1. a. Wetland location (territory) and geographical coordinates (longitude, latitude)

b. Wetland size (in hectares) and average altitude (m)

c. Brief description of wetland geomorphology

1.2. Ownership status of the wetland area (private or public) and the percentage of each.

1.3. Administrative region and prefecture

1.4. Are there any updated and comprehensive maps of the wetland area?

1.5. What is the legal status of the wetland? Is it «protected» (Ramsar site, Natura 2000 site, SPA, National Park, Joint Ministerial Decision, or other)? If more than one regulation exists, the borders are the same or different?

1.6. Is this a single wetland or a wetland complex (a series of more than one wetlands)?

1.7. What are the wetland types present at the site and the approximate percentage of each type? (see Annex I)

1.8. According to your expert opinion is the wetland area adequately represented in the designated protected area?

1.9. Is the wetland national or trans-national?

1.10. What is the human population around the wetland? Please specify any changes and trends during the last 5 years.

1.11. What is the accessibility of the wetland area? Is there a national road, rural roads or paths making access possible to the site, and at what extent?

2. Ecological change

2.1. Does the wetland host or include rare species, communities, habitats, landscape features? Do not provide exhaustive catalogues of species and/or habitats but rather mention them collectively in separate categories and explain why each feature is rare: human impact, relict populations, limit of the range, naturally rare, or missing links.

2.2. What is the number to which the wildlife and vegetation species inhabiting the wetland are rare, endangered, or vulnerable within the region?

	Mammals	Reptiles	Fish	Birds	Invertebrates	Plants
Habitats Directive						
Birds Directive						
Presidential Degree						
Greek Red Data Books						
IUCN Red Data Book						
Bern Convention						
Bonn Convention						
CITES						
Endemic						

2.3. What are the main categories of ecological change in the wetland area (please explain according to the description of Annex II, and note every significant change during the last 5 years).

2.4. a. Is there any monitoring procedure carried out in the wetland to establish and assess ecological changes (such as water quality assessments, estimates of birds, fish or mammal populations, ecological indices, etc.) conducted by either of the following:

	Yes	No	Data not available
Government Authorities			
Local Authorities			
Private Body			
Educational/ Research Centres			
NGOs			

b. If yes, please specify what kinds of parameters are monitored and who is responsible. Is there any assessment procedure for the monitoring programme?

c. If no, are there sufficient baseline data for such a project to start?

2.5. Are you aware of any basic research projects carried out in the wetland and who is responsible?

3. Human Activities

3.1.a. What are the main values of the wetland and their level of significance?

VALUE	**LEVEL OF SIGNIFICANCE**				
	High	Moderate	Low	Not Signif.	Not Avail.
Biodiversity					
Water supply					
Irrigation					
Groundwater Recharge					
Water Purification					
Flood Control					
Erosion Control					
Financial (fishing,					
Energy Supply					
Salt Supply					

Sand Supply					
Aesthetic					
Recreational					
Scientific					
Educational					

b. Could you please provide details for all values of high and moderate significance?

3.2. a. What are the main human activities inside and around the site and their level of significance? (see Annex III)

HUMAN ACTIVITY	**LEVEL OF SIGNIFICANCE**				
	High	Moderate	Low	No Activity	Not Avail.
Agriculture					
Forestry					
Fishing & Aquaculture					
Animal breeding					
Hunting					
Urbanisation					
Industry					
Tourism & Recreation					
Extraction activities					
Communication Networks					

b. *Could you please provide details for the existing activities?*

c. *Are there any significant changes during the last 5 years?*

3.3. What part of the wetland habitats is affected by the above activities?

3.4. Is there any monitoring procedure carried out in the wetland to assess changes and trends in human activities? (These could include statistics, monitoring of cattle number in the wetland, grazing capacity, fish catch, monitoring of pesticides/ fertilisers use etc.). If yes, please provide details. If no, assess whether there are sufficient baseline data.

3.5. Is there any assessment procedure for the monitoring programme? If yes, please provide details.

3.6. Is there any big construction project already taking place or planned to take place in the wetland? If yes, has an Environmental Impact Assessment been elaborated? Please provide details.

3.7. Regarding the above mentioned activities are there any organised groups of stakeholders (e.g. Fishermen association)? What is the degree of their implication to the wetland management (if any)?

4. Management Plan

4.1. Is there a management plan for the area or a document similar to a management plan? Please provide details.

4.2. If there is such a document,

a. *Who is responsible for its implementation? Is there any form of committee or body that oversees the implementation of the plan?*

b. *According to your opinion is the management effective and efficient?*

c. *Is there a regular monitoring of the management plan?*

4.3 Is there a zoning system?

4.4. If yes:

a. *According to your opinion, is the wetland included in zones of land-use–plans that enjoy a satisfactory degree of protection?*

b. *Does the zoning system include actions to control or limit human access to very sensitive or unique areas?*

c. *Are there any buffer zones? If yes, please describe how they are designed and how they are managed.*

4.5. Is the wardening of the wetland sufficient? If not what are the reasons of failure?

4.6. What, if any, do you consider have been the major constraints to have a management plan implemented fully? Please provide details.

4.7. Are there any wetland restoration and rehabilitation projects planned for the site? If yes, have they started been implemented? Who is responsible and what is the management purpose of the project?

5. Actions to increase awareness of wetlands and their values and participation of local population

5.1. Are there any non-governmental environmental organisations at the local level working on the conservation of the wetland? If yes please provide details and specify on whether they are locally based, or locally active.

5.2. Have any actions been taken to encourage active and informed participation of local communities in the conservation and wise use of the site? If yes, please provide details.

5.3. Have any actions been taken to encourage the involvement of individual local people in the management? If yes, please describe these actions and give your views on how successful and valuable these have been.

5.4. Have any actions been taken to encourage involvement of the private sector in the conservation and wise use of the site? If yes, please provide details.

5.5. Is there a visitor information centre at the area? If yes, please provide details regarding its functions and possibilities (how long it exists as fully operating, provision of guided educational visits, information officer, leaflets, education packs).

5.6. Why is the public interested in the wetland? Could you provide a rough estimate of the number of visitors to the site, their nationality, and note the purpose of visits (tourism, special interest tourism, environmental education programmes etc)?

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6. Pearce F. & A.J. Crivelli (1994) - Characteristics of Mediterranean Wetlands. Tour du Valat, Arles – (France), (Publications MedWet; Tour du Valat - number I) 88p.
7. Ramsar Convention Bureau, 1997. The Ramsar Convention Manual: a Guide to the Convention on Wetlands (Ramsar, Iran, 1971), 2nd ed. Ramsar Convention Bureau, Gland, Switzerland.
8. Ramsar Information Sheet (1998)
9. Solander Erik (1998) - WWF European Forest Scorecards – report. 348 pp.
10. Tomas Vives P. (ed). (1996) - Monitoring Mediterranean Wetlands: a methodological guide. Wetlands International, Slimbridge, UK and IUCN, Lisbon. 150pp.

Annex I – Ramsar wetland types and their codes

Marine/Coastal

A - Permanent shallow marine waters less than six metres deep at low tide; includes sea bays and straits.

B - Marine subtidal aquatic beds; includes kelp beds, sea-grass beds, tropical marine meadows.

C - Coral reefs.

D - Rocky marine shores; includes rocky offshore islands, sea cliffs.

E - Sand, shingle or pebble shores; includes sand bars, spits and sandy islets; includes dune systems.

F - Estuarine waters; permanent water of estuaries and estuarine systems of deltas.

G - Intertidal mud, sand or salt flats.

H - Intertidal marshes; includes salt marshes, salt meadows, saltings, raised salt marshes; includes tidal brackish and freshwater marshes.

I - Intertidal forested wetlands; includes mangrove swamps, nipah swamps and tidal freshwater swamp forests.

J - Coastal brackish/saline lagoons; brackish to saline lagoons with at least one relatively narrow connection to the sea.

K - Coastal freshwater lagoons; includes freshwater delta lagoons.

Inland Wetlands

L - Permanent inland deltas.

M - Permanent rivers/streams/creeks; includes waterfalls.

N - Seasonal/intermittent/irregular rivers/streams/creeks.

O - Permanent freshwater lakes (over 8 ha); includes large oxbow lakes.

P - Seasonal/intermittent freshwater lakes (over 8 ha); includes floodplain lakes.

Q - Permanent saline/brackish/alkaline lakes.

R - Seasonal/intermittent saline/brackish/alkaline lakes and flats.*

Sp - Permanent saline/brackish/alkaline marshes/pools.

Ss - Seasonal/intermittent saline/brackish/alkaline marshes/ pools.*

Tp - Permanent freshwater marshes/pools; ponds (below 8 ha), marshes and swamps on inorganic soils; with emergent vegetation water-logged for at least most of the growing season.

Ts - Seasonal/intermittent freshwater marshes/pools on inorganic soil; includes sloughs, potholes, seasonally flooded meadows, sedge marshes.*

U - Non-forested peatlands; includes shrub or open bogs, swamps, fens.

Va - Alpine wetlands; includes alpine meadows, temporary waters from snowmelt.

Vt - Tundra wetlands; includes tundra pools, temporary waters from snowmelt.

W - Shrub-dominated wetlands; Shrub swamps, shrub-dominated freshwater marsh, shrub carr, alder thicket; on inorganic soils.*

Xf - Freshwater, tree-dominated wetlands; includes freshwater swamp forest, seasonally flooded forest, wooded swamps; on inorganic soils.*

Xp - Forested peatlands; peatswamp forest.*

Y - Freshwater springs; oases.

Zg - Geothermal wetlands.

Zk - Subterranean karst and cave hydrological systems.

* As appropriate, includes: floodplain wetlands such as seasonally inundated grassland (including natural wet meadows), shrublands, woodlands or forest.

"Man-made" wetlands

1 - Aquaculture (e.g. fish/shrimp) ponds.

2 - Ponds; includes farm ponds, stock ponds, small tanks; (generally below 8 ha).

3 - Irrigated land; includes irrigation channels and rice fields.

4 - Seasonally flooded agricultural land (To include intensively managed or grazed wet meadow or pasture).

5 - Salt exploitation sites; salt pans, salines, etc.

6 - Water storage areas; reservoirs/barrages/dams/impound-ments; (generally over 8 ha).

7 - Excavations; gravel/brick/clay pits; borrow pits, mining pools.

8 - Wastewater treatment areas; sewage farms, settling ponds, oxidation basins, etc.

9 - Canals and drainage channels, ditches.

Annex II – Factors that may cause significant ecological change

Changes in wetland area: drainage, infilling for land reclamation, reclamation for agriculture – tourism – urbanisation, road construction, waste disposal and rubbish dumping.

Changes in the water regime: water level, water balance, drainage, channelization, embankments, irrigation, activities related to aquaculture.

Changes in the catchment area: dams (for water supply or hydroelectric power), irrigation (river abstraction, groundwater abstraction and over-pumping).

Changes in water quality: nutrient run-off, pesticide and herbicide run-offs, aquaculture effluent, waste disposal, agriculture – urban - industrial pollution, likelihood of pollution by toxic substances (lists I and II of the Directive 76/464/EEC about toxic water pollution), eutropfism, salinity changes (i.e. changes in the connection of the wetland to the sea).

Changes in biodiversity: Introduction of alien species (accidental or on purpose), hunting pressure, livestock pressure, pressure form tourism/recreation, genetic pollution, parasitism, degradation and loss from other causes.

Unsustainable use of wetland resources (the following activities may be sustainable in a different regime): grazing, fishing, hunting, aquacultures, sand extraction, harvesting.

Management, neglect and restoration: control of vegetation by burning/cutting/grazing, restoration of open waters, management of reed beds, illegal constructions, negative attitude of users/ stakeholders.

Annex III – Human activities

Agriculture: land reclamation and drying out, infilling, cultivation, mowing/cutting, fertilisation, use of pesticides, grazing, burning, expansion/ abandonment of cultivated land, change of cultivated crops (loss of local breeds may be referred here), irrigation / changes on the amount of irrigation water, modification of hydrographic functioning, improper use of nutrients and/or chemicals, runoff of nutrients and/or chemicals, erosion, disturbance

Forestry: forest planting, artificial planting, forest replanting, forestry clearance, removal of dead and dying trees, forest exploitation without restoration, destruction of riverine forests, pollution by sawmills, disturbance, etc.

Fishing and aquaculture: professional fishing, leisure fishing, overfishing, illegal fishing (timing, equipment), loss of traditional techniques, fish and shellfish aquaculture depletion of fish-stock, substrate management, etc.

Animal breeding: stock feeding, grazing.

Hunting : over-hunting, illegal hunting, trapping, poisoning, poaching, excessive disturbance, etc.

Urbanisation: human habitation, urbanised areas , expansion of near-by cities, illegal settlements, elevated water demand, disposal of household waste, noise nuisance disturbance by increased population, etc.

Industry: industrial or commercial areas, factories, use of water, discharges, disposal of industrial waste, water/air/soil pollution, disturbance, etc.

Tourism and Recreation: attraction parks, camping and caravans, sport and leisure structures, outdoor sport and leisure activities, interpretative centres, illegal settlements, wetland drainage/filling for acquisition of land, trampling, noise nuisance, large establishments, disturbance, ecotourism, etc.

Extraction activities: sand and gravel extraction, peat extraction, salt works, removal of beach materials, exploration and extraction of oil or gas, mines, open cast mining, etc.

Communication Networks: paths, tracks, cycling tracks, roads, motorways, railway lines, port areas, airport, heliport, etc.

ANNEX II

Declaration on the Creation of the Prespa Park and the Environmental Protection and Sustainable Development of the Prespa Lakes and their Surroundings

We, Prime Ministers Costas Simitis, Ljubco Georgievski, and Ilir Meta, met today, February second of the year 2000, on the occasion of World Wetlands Day at Aghios Germanos in Greece, and agreed that the Prespa Lakes and their surrounding catchment are unique for their geomorphology, their ecological wealth, and their biodiversity, which gives the area significant international importance. The Prespa Lakes and their surroundings provide habitat for the conservation of various and rare species of flora and fauna and offer refuge for the migratory bird populations. They constitute as well a much-needed nesting place for many species of birds threatened with extinction.

We recognize that the conservation and protection of an ecosystem of such importance not only renders a service to Nature, but it also creates opportunities for the economic development of the adjacent areas that belong to the three countries. Furthermore, the long history of the human presence in the area proves the compatibility of traditional activities and knowledge, with the conservation of nature.

We are aware that conservation of Nature and sustainable development largely depend on the respect by governments and people of international legal instruments, which aim at the protection of the natural environment. Participation in such agreements and conventions is helpful for the protection of the Prespa Lakes and their surroundings. Individual national activities should be complemented by international collaboration in this field.

Furthermore, we recognize and value the importance of the work done by the Environmental Non-Governmental Organizations, especially when combining their different though complementary experiences and skills. To that effect we are pleased to recall that such a non-governmental organization, namely the Greek Society for the Protection of Prespa, was honoured in 1999 with the Ramsar Convention Award as an outstanding example of a pioneer approach to wetland management. Finally, we would like to underline the benefits of public awareness in order to achieve the goals of the protection of nature and sustainable development.

Having in mind the above, We decide to declare the "Prespa Park" as the first transboundary protected area in South Eastern Europe and present this initiative as a "gift to the earth" in the context of the WWF Living Planet Campaign. This campaign is aimed at securing the conservation of the world's most important biological resources and ecosystems into the next millennium. The "Prespa Park" consists of the respective areas around the Prespa Lakes, and each of the three countries has declared them a Ramsar Protected Site.

This Declaration will be followed by enhanced co-operation among competent authorities in our countries with regard to environmental matters. In this context, joint actions would be considered in order to a) maintain and protect the unique ecological values of the "Prespa Park", b) prevent and/or reverse the causes of its habitat degradation, c) explore appropriate management methods for the sustainable use of the Prespa Lakes water, and d) to spare no efforts so that the "Prespa Park" become and remain a model of its kind as well as an additional reference to the peaceful collaboration among our countries.