

# Greece, National Strategy for Wetland Resources

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## MINISTRY FOR THE ENVIRONMENT, PHYSICAL PLANNING AND PUBLIC WORKS

### ENVIRONMENTAL PLANNING DIVISION

### NATURAL ENVIRONMENT MANAGEMENT SECTION



## NATIONAL STRATEGY FOR WETLAND RESOURCES

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## INTRODUCTION

This strategy has two scopes. On the one hand, it fulfils our country's commitment, as a contracting party to the Ramsar Convention, to draft its own strategy for the conservation and sustainable use of wetlands. On the other hand, it expresses the country's final strategic choice for wetlands, as shaped by the existing strategic framework (ch. 1.3).

The experience of other countries has shown that wetland problems are tackled more successfully through a national strategy with specific objectives and actions. Thus, the benefits expected from the strategy are:

- development of a single framework of reference for positive actions undertaken anywhere, that is, co-ordination of the actions of various services and bodies at the planning stage in order to avoid fragmentary measures or overlapping of positive actions and therefore unnecessary expenses, and to ensure integrated management of wetland resources
- contribution to the integration of the dimension of sustainable management of wetland resources in sectorial policies
- informing other ministries and bodies involved in development, Local Government and private investors, about national priorities as far as wetland resources are concerned, in order to avoid preparing economic development plans for wetlands that might not be compatible with the conservation of all wetland values
- facilitation of joint (in co-operation with other countries) confrontation of wetland problems at a European level or, in general, at the level of smaller or larger geographical areas

In Greece, the main structural elements of such a strategy are scattered throughout various State documents and reports that concern more general management issues for the abiotic and biotic environment, both man-made and natural.

The **input used** for drafting the national strategy is constituted mainly of (11)\*:

1. **scientific findings** about the functions, the values and the problems of wetlands
2. the **legal framework** that binds the Greek State, as determined by national legislation, international conventions and community acts
3. various national, Community and international documents that recommend the existing **strategic framework**
4. a set of **basic principles** associated with ecological ethics, national requirements and scientific approaches and that are considered as *a priori* acceptable by the majority of Greek citizens.

The strategy that is shaped by this input ensures more numerous and important benefits for the highest possible percentage of citizens and especially those living in the Greek rural areas.

The abundance of initiatives, at the national, European and international level, to halt degradation and manage wetland resources, the natural environment, landscapes and biodiversity in general in a sustainable way, proves how critical a moment it is for all countries to undertake decisive actions for the protection of nature. By combining the rationale behind all these initiatives it becomes apparent that the sustainable management of wetlands can only be achieved through strong political will, integrated

development planning and generous investment in human and financial resources.

**The objective** of this document is:

- a. to describe the input for preparing the national strategy for wetland resources
- b. to set general and specific strategic objectives
- c. to specify the actions required for the implementation of these objectives.

While drafting this document, consideration was given to the principles laid out in the "1997-2002 Ramsar Strategic Plan", that was presented at the 6<sup>th</sup> Conference of the Contracting Parties in Brisbane-Australia, in March 1996, and to the "Venice Declaration on Mediterranean Wetlands" (MedWet project conference, Venice, June 1996).

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## **1. INPUT FOR DRAFTING THE NATIONAL STRATEGY FOR WETLAND RESOURCES**

### **1.1. Scientific findings**

#### ***1.1.1. Definition and types of wetland***

The Greek term for "wetland" ("ygrotopos") is relatively recent and was devised in order to provide a translation for the English word wetland (word-for-word "wet ground" or "wet land"), which also has a history of a few decades only.

As a scientific term, the word wetland indicates collectively any area that is covered seasonally or permanently by shallow water or that is never covered by water but has a humid substratum (soil, sand, etc) during a long period of the year. Wetlands are fresh water, saline or brackish shallow lakes and shallow rivers, marshes, lagoons, springs, peatlands.

According to the official definition of the Ramsar Convention "**wetlands** are areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tides does not exceed six meters". According to the same Convention, wetlands are also "riparian and coastal zones adjacent to the wetlands, and islands or bodies of water deeper than six meters at low tide lying within the wetlands".

Individuals whose primary concern was to protect migratory aquatic birds formulated the Ramsar definition 28 years ago. Until now, it has not been necessary to amend it despite the fact that it contains certain weaknesses. For example, the number and type of wetlands that it mentions is limited. In order to overcome this weakness, the countries that have ratified the Ramsar Convention, at their fourth meeting in Montreux-Switzerland, in 1990, approved an extensive list of types of wetland (Table 1) to which the Convention refers. This record may be considered as a complement to the definition.

**Table 1: Classification system for types of wetland approved by the 4<sup>th</sup> meeting of the Contracting Parties to the Ramsar Convention in Montreux, in 1990.**

Marine and coastal wetlands

1. Marine waters – permanent shallow waters less than six meters deep at low tide; includes sea bays, straits
2. Subtidal aquatic beds; includes kelp beds, sea-grasses, tropical marine meadows.
3. Corral reefs.
4. Rocky marine shores; includes rocky offshore islands, sea cliffs.
5. Sand, shingle or pebble beaches; includes sand bars, spits, sandy islets.
6. Estuarine waters; permanent waters of estuaries and estuarine systems of deltas
7. Intertidal mud, sand or salt flats.
8. Intertidal marshes; includes saltmarshes, salt meadows, saltings, raised saltmarshes, tidal brackish and freshwater marshes.
9. Intertidal forested wetlands; includes mangrove marshes, nipa marshes, tidal freshwater marsh forests.
10. Brackish or saline lagoons with one or more relatively narrow connections with the sea
11. Freshwater lagoons and marshes in the coastal zone; includes delta lagoon and marsh systems.

Inland wetlands

1. Permanent rivers and streams; includes waterfalls.
2. Seasonal and irregular rivers and streams

3. Inland deltas (permanent)
4. Riverine floodplains; includes river flats, flooded river basins, seasonally flooded grassland, savanna and palm savanna.
5. Permanent freshwater lakes (over 8 ha.); includes large oxbow lakes
6. Seasonal freshwater lakes (over 8 ha.), floodplain lakes
7. Permanent and seasonal, brackish, saline or alkaline lakes, flats and marshes
8. Permanent freshwater ponds (below 8 ha.), marshes and marshes on inorganic soils; with emergent vegetation waterlogged for at least most of the growing season
9. Seasonal freshwater ponds and marshes on inorganic soil; includes sloughs, potholes, seasonally flooded meadows, sedge marshes.
10. Shrub marshes; shrub-dominated freshwater marsh, shrub carr, alder thicket; on inorganic soils.
11. Freshwater marsh forest, wooded marshes; on inorganic soils
12. Peatlands; shrub or open bogs, fens
13. Forested peatlands; peat marsh forest
14. Alpine and tundra wetlands; includes alpine meadows, tundra pools, temporary waters from snowmelt.
15. Freshwater springs, oases
16. Geothermal wetlands.

### Man-made wetlands

1. Water storage areas; reservoirs, barrages, hydroelectric dams, impoundments (generally over 8 ha.)
2. Ponds including farm ponds, stock ponds, small tanks (generally below 8 ha.)
3. Aquaculture ponds; fish ponds, shrimp ponds.
4. Salt exploitation; salt pans, salines.
5. Excavations; gravel pits, borrow pits, mining pools
6. Wastewater treatment; sewage farms, settling ponds, oxidation basins
7. Irrigated land and irrigation channels; rice fields, canals, ditches
8. Seasonally flooded arable land

### ***1.1.2. Wetland functions and values***

#### *1.1.2.1. Wetland functions*



Wetlands are ecosystems in which multiple natural **functions** (or processes) occur. Not all these functions are performed in all wetlands and sometimes they are performed to a different degree, at a different time and in a different way. The functions of a wetland, just like of any other ecosystem, are not fulfilled independently but in an interactive way. The primary factor however that determines the way in which a wetland functions, is its hydrological regime. Understanding the wetland's hydrology should be the first concern of those who deal with its conservation and management (13, 23).

Wetland functions are (13):

- *Recharge of underground aquifers*

The vertical (or even horizontal sometimes) movement of water towards an aquifer results in its replenishment. Many geological and hydrological factors determine whether this function will be fulfilled in a wetland and to what extent, or whether the opposite will occur. That is, the replenishment of the wetland by water from the aquifers, which is not a rare occurrence. Both functions are very interesting, particularly for countries such as Greece where water is considered as a "scarce resource" already.

- *Modification of flood phenomena*

The presence of wetlands in a hydrological basin can modify a flood in two ways. Firstly, by reducing the total volume of floodwater and secondly, by reducing flood peaks. In other words, they can render the flood less torrential. In this case, wetlands function as regulatory tanks. The total volume of water may be reduced because wetlands can store a certain quantity of floodwater.

- *Entrapment of sediments and other substances*

Water that ends up in wetlands contains various substances, either diluted or in suspension. Some of these substances do not affect organisms directly but they have a nutritional value for the organisms or are toxic for them. Certain wetlands that receive flowing water, reduce flow velocity, particularly those that have dense vegetation (e.g. reedbeds). This facilitates sedimentation of depositing materials. Moreover, a wetland can

break up substances or remove some of them from the system, through complex processes. Wetland vegetation plays a primary role in all these processes.

- *Storage and release of heat*

Water has a very high heat storage capacity. This unique property of water makes oceans and deep lakes act as heat reservoirs because during the warm period of the year wetlands store heat and release it during the winter. Shallow marine areas, shallow lakes, marshes and even wet soils of course, fulfill the same function, to a lesser extent. As a consequence, the differences in air temperature – winter/summer and day/night – are much less important over or next to areas where water dominates than far from them.

- *Absorption of carbon dioxide*

The amount of carbon dioxide in the atmosphere has begun to increase during the last 200 years i.e. since the industrial revolution. It has been assumed that part of the total amount of carbon dioxide produced has been "trapped" by the hydrosphere, which acts as the main regulator of the atmosphere's content in carbon dioxide. Wetlands constitute about 6% of the hydrosphere. In view of the global warming phenomenon, the importance of this function is obvious.

- *Binding of solar radiation and support of food chains*

Various autotroph organisms bind solar radiation in wetlands. Differences between wetland ecosystems, in simple terms of primary productivity, are very important and are due mainly to differences in the availability of nutrients. Certain marshes with reedbeds are among the most productive wetlands. Net primary productivity is the basis of secondary productivity, i.e. the productivity of the ecosystem in heterotroph organisms (consumers). Trophic webs in wetland ecosystems are often more complex than those found in terrestrial ecosystems and in deep-water ecosystems.

#### 1.1.2.2. Wetland values

**Values** are services and goods that wetlands offer to Man. Wetland values are not independent of one another. Usually, the improvement or the degradation of one value results in the improvement or the degradation of one or more of the other values. The multiple uses of wetlands is a common cause of conflict among users. Moreover, values are not equally important in all wetlands. However, there is no wetland that has no important value for all people or for a group of people, currently or in the future (13, 23).

Wetland values may be (13):

- *Biological (Biodiversity)*

The term biological diversity or biodiversity expresses the variety of life forms existing in an area and/or generally on Earth (genetic diversity, species diversity and ecological diversity). Biodiversity has supported and supports Man's existence. It is a "potential" natural resource, a timeless value without frontiers. Man's food originates from wild species of plants and animals cultivated and reared. Apart from food, plants and animals cover many other needs, e.g. clothing, transportation, housing, health and recreation. The industrial uses of plants and animals, and also microorganisms are countless. Apart from genetic improvement of species that have been domesticated already, biodiversity is a pool of resources for satisfying more needs in the future. Wetland biodiversity is a remarkable part of Earth's biodiversity. Many species of plants and animals that depend on wetlands are also of direct economic importance. Species diversity in a wetland ecosystem is affected by abiotic factors and especially the hydrological regime and the physical and chemical properties of water and the substrate. Above all, the biodiversity of a wetland is the result of countless interactions between the parts that form the ecosystem. Best possible knowledge of these interactions leads to successful management. The value of biodiversity is supreme to all other ones. Therefore, biodiversity should not be affected by the use of other values.

- *Water supply*

Water supply is considered as the most important value use of wetlands. Covering the continuously increasing water needs of Greece will depend

increasingly on surface water rather than ground water. The protection of wetlands from unwise management and pollution could be based on a single argument only: they offer drinking water both directly and indirectly by replenishing underground aquifers.

- *Irrigation*

Practically all Greek freshwater wetlands, natural and artificial, are used for irrigation to a certain extent. The role of irrigation in agricultural production and development is extremely important and uncontested. However, if one considers the experience of four decades and current knowledge of the multiple values of wetlands, one concludes that the use of the irrigation value of wetlands has not been without adverse impact for the other values. The protection of wetlands that are used as sources of irrigation water should include measures against pollution. The use of water that is free of harmful substances and pathogenic microorganisms protects the health of farmers and consumers and contributes to the sustainability of arable land.

- *Fishing*

The main types of wetland that fulfil the conditions for ensuring satisfactory populations of marketable fish are lagoons, lakes (natural and artificial) and rivers. Sound management of the ecosystem and special care for fish populations can yield very important fish production. Apart from fishing, wetlands are used for intensive aquaculture that causes problems in the functioning of the ecosystem. The richness and the composition of the fish fauna of a wetland are secure proof of its good state. Apart from economic benefits, when fishing is performed wisely, it contributes to their protection as well. This is because the existence of fish populations of high market value, presupposes a healthy ecosystem with very high quality of water and aquatic vegetation that provides sufficient spawning sites and protected wintering grounds.

- *Animal farming*

Many wetlands offer rich grazing material for cattle, sheep and goats during a long period of the year. Livestock have constituted part of the animal community of Mediterranean wetland ecosystems for thousands of

years, having contributed to a large extent to their structure and evolution. This effect remained stable until today. Recently however, two trends have appeared. In certain wetlands the number of grazing animals is increasing whereas in others it is decreasing. When changes in grazing patterns are not the result of a special management study, they can cause undesirable changes in vegetation and the ecology of the area in general. On the contrary, controlled grazing may constitute a valuable management tool in a wetland area.

- *Felling*

A wetland has a felling value if its vegetation can provide materials to be used for timber or other purposes (paper pulp, baskets, mats etc). In general, wooded wetlands in plains have the greatest felling value. In particular, concerning reedbed management securing a smooth performance of wetland functions, constitutes a scientific problem that can be solved after many years of experimentation. As for riparian forests, they are so scarce and small that the main objective of their management should be the protection of natural functions whereas wood harvest should be very restricted.

- *Hydroelectricity*

With the exception of a few lakes situated at a high altitude, rivers that cross mountain areas, usually have a hydroelectric value. Hydroelectric power is considered as a clean form of energy. However, the dams that are constructed for the use of this value have adverse impact such as the destruction of natural vegetation, change of landscape and hydrological regime in downstream areas, reduction in deposited sediments at river estuaries etc. Hydroelectric dams usually serve irrigation purposes as well. They should be integrated in the more general framework for the water resources management of a large area or the entire country. Moreover, the mitigation of the economic, social and ecological impact for downstream terrestrial and wetland areas, and the coastal fisheries economy should be included in the cost of the dam.

- *Salt extraction*

The concentration of sea salt in specially prepared coastal areas – saltworks - is an ancient technique. For a very long time, salt has been used in Man's food and today it is used as a raw material for a variety of industrial purposes. Mediterranean saltworks harbour a rich avifauna. In Greece, the saltworks of Messolonghi and Kitros Pierias are well known for their ornithological importance. Many saltwork companies in other Mediterranean countries, and in Greece as well, co-operate with ornithologists so that salt extraction is as far as possible compatible with the conservation of wild fauna.

- *Sand extraction*

Sand is one of the inorganic materials transported by a river that is used widely in the construction business. Extraction rights belong to the State that concedes them to the closest communities or to private individuals. The use of the sand extraction value should be totally controlled. Any illegal sand extraction harms natural vegetation and fauna. Sand extraction in rivers, when carried out in a controlled and planned manner, does not constitute a problem. There are some lakes however, where sand reserves are finite. In these lakes, it should be examined carefully whether the system allows for the extraction of sand without giving rise to adverse impact.

- *Scientific value*

Increasingly, wetlands attract the interest of scientists. As a result, the values and functions of wetlands are better documented. Scientific issues such as inventorying, classification, evaluation, monitoring of wetland ecosystems, biodegradation of organic matter, paleoecology, biodiversity, use of wetland habitats, hydrological period etc constitute important areas in which scientific efforts are being made. As regards the positive and negative effects (especially positive) that wetlands have on other types of ecosystems and reversely, information is insufficient. However, the interest in wetlands as distinct ecosystems is increasing at an important rate.

- *Educational*

Wetlands occupy a dominant position in Environmental Education that is becoming increasingly important. Wetlands are considered particularly attractive areas for training in Environmental Education, because of their high scientific value and the fact that one can observe more and faster changes in images, sounds and events than in terrestrial ecosystems. Familiarisation with a wetland and its study gives children the opportunity to form a picture about the water cycle, the nutrients cycle in nature, trophic relations between species etc, and also the adverse consequences of ignorance or avidity.

- *Cultural*

The cultural value of a wetland consists of its relations with mythology, history, archeology, religion, folklore and literature. Traditional economic activities related to agriculture, fishing, home handicraft, building etc constitute a part of this value also. These elements of our traditional culture should be recorded and their importance should be studied. At some point in time, relevant knowledge may prove to be useful both for our everyday life and for the management of wetlands.

- *Recreation*

Passive recreation activities include bird watching, photography, landscape admiration etc. Active ones include activities and sports that are related to water (such as sport fishing, sailing and swimming) or the surrounding terrestrial area (such as cycling or riding). Mass tourism is likely to threaten the wetland ecosystems if priority is given to active recreation rather than other uses. Eco-tourism is based mainly on nature and landscapes of outstanding natural beauty, the observation of wildlife and archaeological and historical monuments. But eco-tourism also requires careful planning and organisation in order to minimise disturbance that it will cause to the natural environment and to ensure that it will contribute positively to the local economy.

- *Flood control*

All our riparian wetlands in which natural vegetation has been left unharmed – a rare occurrence – have a flood control value. All torrents that cross urban areas have a high flood prevention value, and human lives

and property are threatened by confining them. Examples of wetlands in Greece that have an important flood prevention value are Lake Karla in the past and artificial Lake Kerkini today.

- *Erosion control*

Riparian wetland vegetation has among other an erosion control value because it retains the soil and diffuses the erosion forces of flowing water and waves. In many parts of the world it has been observed that coasts are being eroded to an alarming degree by sea waves following the alteration of coastal wetlands. Studies and estimates that have been made along the coasts of certain deltas in Macedonia justify a certain concern.

- *Improvement of water quality*

Wetlands can improve water quality by removing pollutants through natural processes. This does not mean that it is wise to use our natural wetlands as recipients for pollutants. We should learn from our natural wetlands and construct artificial ones so as to increase their capacity to improve water quality and to use them for the treatment of effluents.

- *Improvement of climate*

The milder climate that prevails in wetlands and the peripheral zone, as compared to areas that are far from wetlands is beneficial for all inhabitants (e.g. heating requirements are less important in wetlands). Farmers in the peripheral cultivated zone benefit particularly because they have a wider choice of plant species. Exhaustion and damage to plants from freezing weather and heat waves are rarer and not very important. Pollinating insects that are very important for the fruit-bearing potential of certain species are more numerous near wetlands than far from them. From the point of view of climate, wetlands not only have a local but also a worldwide value because of the role that they play in trapping carbon dioxide from the atmosphere.

### ***1.1.3. Greek wetland resources today***

The most complete inventory was drawn up in 1992-93 by EKBY with the support of the central and prefectural services of the Ministries of



Environment, Physical Planning and Public Works and of Agriculture, in co-operation with specialised scientists and environmental organisations from all over Greece. According to this inventory (26), our country's wetland resources consist currently of small and large wetlands or groups of wetlands that cover about 2 million stremmata. The number and area of the wetlands, by type of wetland, is shown in Table 2.

**Table 2. Abundance and area of Greek wetlands by type of wetland (26)**

Type of wetland	Number of areas	% of total number	Area(hectars)	% of total area	Length (in km)
Deltas	12	3.2	68030	33.58	
Marshes	75	19.8	5832.6	2.88	
Lakes	56	14.8	59767.3	29.50	
Lagoons*	60	15.9	28766.5	14.20	
Springs	17	4.5	133.1	0.06	
Estuaries	42	11.1	4264.6	2.10	
Reservoirs	25	6.6	35823.5	17.68	
Rivers	91	24.1	-	-	4268
TOTAL	378	100.0	202617.6	100.0	4268

\* Lagoons in estuary systems are not considered as separate wetlands

The inventory includes forms that have been completed for 378 wetlands, which contain information on the site, the area, the most important biotic and abiotic features, the values, the uses, the threats, the legal status etc. It is estimated that together with certain smaller wetlands that it was not possible to inventory in that phase, their number reaches or exceeds 400.

Because of the type of landscape and the dry and warm climate of Greece, these resources are very important economically and this importance is increasing continuously (increase in water requirements, global climate change etc).

Compared to other more economically developed countries, the quality of Greek wetlands is generally high.

#### ***1.1.4. The problems of Greek wetlands***

During the 20<sup>th</sup> century, starting from the 1920s, and especially the mid 1960s, approximately 2/3 of the wetland area of Greece was drained (13). Losses concern mainly marshes and certain lakes and rivers. At the time, drainage had been deemed necessary to confront the important problems of malaria, flooding, the supply of irrigation water and the acquisition of more areas for cultivation. In addition to drainage, other interventions were made (e.g. confinement of riverbeds, clearing of natural vegetation, construction of dams). Thus, for example, the main factors that led the Greek state into implementing large scale land reclamation projects in the plain of Serres, from 1928 to 1936, were the refugee problem during the years that followed the Asia Minor disaster and malaria that was seriously afflicting the population (3).

Currently it is established that a lot of drainage and other interventions were mistaken because not only did they not yield the expected economic and social benefits and secondly, they led to the loss of values that at the time were unknown (27). For example, the final drainage of the very important, from an ecological and economic point of view, Lake Karla in 1962 did not contribute as much as expected to flood protection because the necessary additional projects were not implemented (27). Moreover, the loss of the wetland caused environmental problems, e.g. transport of pollution through the drainage tunnel to the Pagasitikos, depletion of underground aquifers and deterioration of extreme climatic conditions in the area, such as frost that affected crops more often. The new areas reserved for cultivation were encroached to a large extent and the expectations for attributing agricultural land to the landless were satisfied only partially (27). It should be noted that the way in which Greek wetlands were treated did not differ from the way they were treated in other parts of the world, even in countries whose national economy was not very dependent on wetland resources.

Whereas today Greek wetlands continue to be threatened to a certain degree by drainage, at the same time, the local populations of certain

drained wetlands not only express wishes for restoration (e.g. lakes Karla, Lanza, Mavrouda) but also implement such plans.

Currently, Greek wetlands continue to be threatened by alteration of their functions which means degradation of their values, despite the fact that certain positive step in the direction of their sustainable management have started already within the current decade.

Out of the 378 wetlands included in the "Inventory of Greek Wetlands as Natural Resources" (26), information about the factors of degradation was available for 291 of them. These parameters were qualitatively graded as of high, medium or low importance. The high and low importance degradation parameters were grouped into four impact categories (28), namely, into factors that cause:

- change of the hydrological regime (special causes are river diversion, dam construction or other constructions for retaining and storing water, irrigation networks)
- depletion of wetland resources (special causes are drainage, sand extraction, clearing of natural vegetation, over-pumping, illegal hunting, illegal felling, over-fishing)
- change in water quality (due to agricultural, industrial and domestic pollution)
- loss of wetland area (special causes are the expansion of cultivated areas, road construction, tourism and recreation, housing development)

The elaboration of relevant data showed that (28):

- **Change in hydrological regime** affects about half the springs and 40% of rivers. The main reasons for this are irrigation networks and the construction of dams that serve the increased water needs of modern agricultural practices. Obviously irrigation networks cannot be abolished because agriculture depends on irrigation water. However, more efficient water resource management could ensure more water for natural ecosystems (28).
- **Depletion of wetland resources** was observed in about 40% of the deltas, natural lakes and aquifers, but not in the other types of wetland. Within this impact category, illegal hunting (in about 13% of wetlands) is the dominant factor. This occurs despite the fact that prohibited zones and similar regulatory provisions have been instituted in many areas because insufficient guarding encourages the numerous hunters to trespass. Pressure from hunting is particularly high in deltas because they host a large number of migratory or wintering birds. In about 12% of

wetlands, a clearing problem is observed, and over-pumping, which affects about half the springs, is just as serious a problem. These problems are due to increased demand for agricultural land and irrigation water. Over-pumping of underground water is due to increasing water supply and irrigation needs (28).

- About half the wetlands appear to have **water quality problems**, mainly because of agricultural pollution and pollution by urban effluents. Pollution of agricultural origin appears to be an important factor, and so does the extensive use of agrochemicals. Efforts to reduce agricultural pollution require the implementation of special measures approved at political level. Again, deltas are the type of wetland affected most (about 50%) by pollution of agricultural origin, and lakes and rivers follow. Such wetlands receive surface run-off from neighbouring cultivated plains. Inefficient operation of waste treatment plants (especially in small towns) and the fact that no tertiary waste treatment is carried out, cause problems of increased organic load in receiving water bodies and consequently the deterioration of water quality in several wetlands (about 16%). The types of wetland that present this problem more often are coastal wetlands, deltas and estuary systems, because their wider areas are usually the most densely populated, either permanently or seasonally because of tourism (28).
- **Loss of wetland area** affects about 60% of marshes and half the deltas and estuary systems. The extension of agriculture is a cause that has been known for a long time. More recently, housing development has been added to the causes. Lakes and deltas are threatened most by the extension of agriculture, and coastal wetlands are most subject to pressure for housing development (construction of country houses and tourist infrastructure) (28).

### ***1.1.5. Underlying causes of the problems faced by wetlands***

Based on the presentation of the underlying causes of biodiversity loss, adopted by the Organisation for Economic Co-operation and Development (OECD) (19), the deeper causes of the problems of Greek wetlands are as follows:

#### **a. Lack of markets and ownership titles**

Lack of markets is actually the lack of a domestic market (and insufficient information about the market abroad) for i. products that have been produced in a sustainable way either by the primary sector (e.g. agriculture, farming, fishing, apiculture), or by the

secondary sector (e.g. certified products from industries that conform with strict environmental rules, objects made of wood, cane or matting originating from systems that are managed in a sustainable way) and ii. soundly planned and organised eco-tourism and sports and recreation activities (tertiary sector services) (21).

Wetland areas in Greece belong mainly to the state. Despite this, municipalities, communities and private individuals own a small percentage of land, in the peripheral zones of wetlands in particular. Moreover, only recently has work commenced on the National Cadaster. As a result, certain illegal actions are facilitated, for example, encroachment of wetland expanses following burning of natural vegetation or a drop in the water level of a lake, are facilitated. Work has now begun, as was mentioned above, and it has started in the wetlands of international importance.

#### b. Shortage of information

Shortage or lack of information is in fact the lack of a constant flow of information towards central services about what happens in wetlands. It also means insufficient informing of decision-makers; lack of information on sustainable practices in hydrological basins, unsatisfactory awareness of the public at large and of specific community groups, and finally lack of knowledge on certain purely wetland issues and inadequate forecasting about the effects of management practices or other protection-promotion projects for wetlands. The above result in erroneous management, observed in the past and currently, both in our country and worldwide. Such operations are, e.g. the importation of foreign genetic material, inappropriate fisheries regulation, inappropriate hydro-period, encouragement of eco-tourists without sufficient study and infrastructure, inappropriate management of reedbeds, incorrect grazing and felling regulations).

Other types of damage could have been avoided if there was sufficient knowledge. These are linked to the clearing of wetland forests for cultivation that was proved to be unprofitable, the improvement of certain pathogenic and other soils that provided nothing to farmers and the drainage of coastal wetlands that acted

as a "shield" against salting of underground water etc. Many such actions led rapidly to economic damage for inhabitants who had expected to benefit.

### c. Institutional weaknesses

Insufficient financial subsidies for sustainable practices, and consequently the lack of real encouragement for inhabitants of wetland areas to adopt these practices constitute a basic institutional weakness. Some progress has been made in this area with the implementation of Regulation 2078/92 EC. Moreover, the way in which the institution of Environmental Impact Assessment operates at a European level sometimes affects wetlands adversely, because the cost-benefit ratio of development projects is only estimated occasionally. In Greece, for example, only in a few cases has economic damage downstream been considered in the estimation of the cost of a dam construction project.

Deficiencies and difficulties also result from the administrative organisation of responsibilities at central, regional and prefectural level, as regards the evaluation of Environmental Impact Assessment studies. Of course, the fact that all projects and activities carried out in protected wetland systems (e.g. Ramsar, NATURA 2000) are environmentally assessed by the central environment services of the Ministry for the Environment, Physical Planning and Public Works is positive.

An institutional problem arises from the fact that no legally consolidated management co-ordination schemes for the most important wetlands have started operating in our country yet. Thus, the responsibilities of public services involved in the management of wetlands (services of the Ministries of the Environment, Physical Planning and Public Works, of Agriculture, of Development, of Merchant Marine, of Health and of others, partially and in specific cases), are not always sufficiently co-ordinated. The institution and operation of wetland management schemes is expected to bring about positive results for sustainable use and therefore conservation of wetland resources.

Existing legislation on the protection of the environment in Greece is in general satisfactory. The detection of any weaknesses is a difficult task that exceeds the objectives of this document. An example of a clear weakness in environmental protection legislation in general and wetlands in particular is the absence of provisions for compulsory restoration of damages caused by the illegal activities of natural or legal entities. Thus, whereas penal and administrative sanctions are foreseen for those who cause damage to the environment and, in certain cases, mechanisms for halting damaging activities, it is not at all self-evident that competent services or the entity which caused environmental damage are obliged to carry out remedial interventions to restore the damage, even if this damage is very serious.

#### d. Weaknesses in the implementation of legislation

Insufficient guarding and policing to avoid illegal interventions, and the often encountered "impunity" *status quo*. In general, the lack of a mechanism for the observance of legislation on the one hand and environmental terms set for projects and activities (INSPECTORATE), facilitate individuals or social groups in violating regulations and protection measures continuously. Thus, wetlands may be affected by illegal hunting, disturbance by uncontrolled access of visitors to sensitive areas, illegal release of pollutants, illegal clearing of reedbeds, encroachment of public land, illegal housing and legal but unwise change in land use in order to serve the interests of social groups that are indifferent to the conservation of all other wetland values apart from the one that is of economic interest to them.

In conclusion, the problems of Greek wetlands, as described in ch. 1.1.4. are due, on the one hand to the above deficiencies and weaknesses, and on the other hand are the result of past policy measures, the practice of primary sector activities (agriculture, farming, fishing), secondary sector activities (industry, manufacture) and third sector activities (tourism, transport, provision of services). These policy measures either considered the use of wetland resources as being costless or clearly underestimated the cost thus allowing for a non-sustainable use of wetland resources. This consists in their short-term and exhaustive exploitation, the objective being to maximise short-term economic benefit or even to reduce or

eliminate some of the other wetland values due to the unwise use of some of them. Various grants, the existence, growth or decline of specific markets for specific products (market forces), tax regulations and allowances for infrastructure and equipment have served as tools-incentives for this exploitation.

Thus, these policy measures should be amended based upon the conclusions of consolidated worldwide research, according to which integrated sustainable management of wetland resources ensures not only more benefits for more people today and in the future but is also scientifically feasible.

Currently, two opposite trends can be identified in Greek society as regards wetland resources (and environmental issues in general). The first one will lead to a continuation or even deterioration of wetland degradation due to the persistence of existing non sustainable activities and, in certain cases, the addition of new ones. The second trend will lead to the halting of degradation through an increasing number of research, educational, training and awareness projects, and institutional improvements and economic support for the adoption of sustainable practices. In general, the first trend overrides the second one although in certain wetlands there are signs that the gap has started to narrow (11). The positive trend is supported also by the State through a series of projects and activities in important wetlands (see ch. 4).

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## **1.2. The legal framework**

The legal framework considered for drafting the national strategy for wetlands is sufficiently broad. It consists of Greek legislation, community acts and international conventions (15, 17, 32) and is presented in Annex A. Basically, given their broad orientations and objectives and the large number of actions that they foresee, some of these pieces of legislation constitute strategic frameworks. For this reason, they are described in ch. 1.3.: " The existing strategic framework".

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## **1.3. The existing strategic framework**



The framework for drafting the national strategy for wetland resources consists of documents of strategic content about the environment and natural resources that have been produced by competent services at central level, and documents that have been produced by international and non-governmental organisations and larger international working groups.

Specifically, the European Union policy should be considered as expressed through the 5<sup>th</sup> Action Plan of the European Community for the environment and sustainable development and especially the document entitled "Wise Use and Conservation of Wetlands".

Certain legislative acts are mentioned also in the existing strategic framework for the reason explained in ch. 1.2. above. Moreover, bibliographic references of strategic orientations and previous efforts to formulate a strategy for wetlands or the natural environment of Greece in general, is presented in Annex B together with a brief discussion.

The most important relevant measures with which the National Strategy should be compatible are the following:

### ***1.3.1. National policies***

#### ***1.3.1.1. Greek Environmental Policy***

The objectives of Greek environmental policy, as mentioned in the National Report that was drafted especially for the "Conference on Environment and Development" that was organised by the United Nations and took place in Rio de Janeiro in 1992, are as follows:

- The maintenance of the equilibrium of natural ecosystems
- Sustainable use of natural resources
- Sound conservation and management of natural systems and biodiversity with special emphasis on coastal systems, wetlands and islands.
- The integration of environmental dimensions in all development policies that concern the various sectors of activity
- The consideration of environmental education and public awareness as first priority activities
- The promotion of the collection and dissemination of information

For the natural environment in particular, the same report mentions that special priority should be given to the following issues:

- Effective management and protection of protected areas and the extension of their boundaries
- Rehabilitation of degraded natural areas
- Zoning of activities
- Safeguard of a balanced co-existence of man-made and natural ecosystems
- Prevention of forest fires and soil erosion
- Wise use of materials and techniques in agricultural production
- Protection of habitats and species
- Special measures for wild fauna

#### 1.3.1.2. National policy for wetlands

The national policy for wetlands is not an "independent" and narrow subject. It is part of an integral functional entity that includes the conservation of biodiversity, sustainable management of natural resources, care for the landscape and cultural heritage, and physical planning.

During the past decade, the Ministry of Environment, Physical Planning and Public Works has shown particular interest in the country's wetlands. For example, the fact that the procedures of the National Cadastre has commenced from the wetlands of international importance is a national choice. Moreover, the interest shown by the Ministry of Environment is proven by the implementation of study, infrastructure and equipment projects for wetlands of international importance. These have been carried out or are being implemented through the 1<sup>st</sup> and 2<sup>nd</sup> CSF. The promotion of legislative acts for their protection and the establishment of their management bodies also constitute proof of political will.

The main features of the Policy on Wetlands, for the 1995-2000 period, are expressed by the following measures:

- Prevention of degradation through effective control of projects and activities that are potentially harmful to wetlands, through environmental impact assessment studies (EIA)
- Evaluation of wetlands based on European Union criteria at a national level and proposals for inclusion in the NATURA 2000 European Network (Directive 92/43/EC)

- Monitoring of water quality in large rivers and coastal areas
- Survey of properties situated in wetlands and peripheral zones as part of the National Cadastre
- Protection measures and financing actions that constitute a priority for the conservation of wetlands (this is achieved through the elaboration of Specific Management Studies (SMS), the institution of legislation such as Joint Ministerial Decisions (JMD), Presidential Decrees (PD), regulations etc.)
- Financial support for the implementation of agri-environmental (sustainable) management measures in agricultural areas that are adjacent to wetlands
- Promotion of research, monitoring and wise management of wetlands
- Promotion of environmental education and public awareness.
- Integration of the concept of multiple wetland values in sector policies for fishing and tourism
- Recreation or even rehabilitation- restoration of wetland ecosystems
- Promotion and active support for international co-operation for the sustainable management of wetland resources in the Mediterranean basin

Existing policy has been adopted by the Ministry for the Environment, Physical Planning and Public Works in co-operation with the Ministry for Agriculture. As most actions are carried out with financial support, they have to be approved by the Ministry for National Economy. Moreover, the applied policy is conforming to a large extent with the relevant policies of the European Union and has been harmonised with their philosophy.

#### 1.3.1.3. National policy for water resources – Proposed Community Water Framework Directive

Despite the fact that considerable progress has been made as regards the confrontation of single issues, existing European policy for water had remained fragmentary until recently, both as regards its objectives and the means of implementation. In order to produce a single legislative act that would approach water management in an integrated way, in February 1997 the European Commission, adopted a Proposed Water Framework Directive, which endeavours to:

- widen the range of protection of water resources to all waters, underground and surface
- achieve or maintain a "satisfactory status" for all waters by the year 2010
- approach water resources management at the hydrological basin level

- co-ordinate all measures adopted that concern specific problems and sectors, that target the achievement of specific objectives and determine the relationship between measures based on emission limit values and quality standards
- ensure realistic monetary valuation of all services that are related to the use of water (and especially water supply and collection-treatment of effluents and waste), by the year 2010
- increase the participation of the public and interested bodies in water policy, promote further transparency with its resulting positive consequences in ensuring its implementation
- consolidate and complete past fragmentary European legislation on water (seven existing Directives will be abolished upon its implementation)

The Council has not adopted this Directive yet. Despite this, since 1997, continuous negotiations are being carried out within the European Council (and between the Council and member states of the EU), and the European Parliament regarding the final content of the Directive. This is due to the fact that numerous commitments will apparently ensue from the implementation of this Directive, and their fulfilment will require time, financial resources, investment in human resources and technical infrastructure, and re-definition of institutions and laws. In other words, it will be necessary to change the orientation of water policy in order to achieve protection of the quality and quantity of water, and eventually fulfil the objective of sustainable management of water resources, since, for the first time, the broader environmental - ecological dimension of water resources is considered in the legislative rationale in such a systematic manner.

The national policy for wetland resources is under preparation, based on the above Directive, because the need for redefining of existing policy is clear. In other words, the environmental, social, economic, institutional and political parameters of water management will have to be re-defined.

Greece has already expressed its great interest in the subject, through its active participation in the relevant consultations. Priorities set for the drafting of a new national water policy are:

- the confrontation of the problem of vague, defective, fragmentary or overlapping activities in water management
- the institution and activation of management bodies for water resources (with a flexible legal form)

- monitoring of qualitative and quantitative indicators in protected areas

The new policy will be drafted in cooperation with the Ministries of Environment, Physical Planning and Public Works, of Agriculture and of Development mainly. The elaboration of a national strategic plan and the organisation of sustainable management of water resources will be proposed by the State for implementation under the 3<sup>rd</sup> CSF.

#### 1.3.1.4. Draft management plan for the country's water resources

In order to approach the subject of water resource management, at a national and regional level, the Water Potential and Natural Resources Directorate of the Ministry for Development, in co-operation with public sector bodies (National Polytechnic School, Geological and Metallurgical Research Institute and the Centre for Research and Programming) has elaborated a special study. In the introduction to the document it is noted that the study constitutes an attempt to approach a management programme for water resources that aims at the support of development policy, as expressed through the existing 2<sup>nd</sup> Community Support Framework projects (1995-1999) and contributes to the development of water resources and the protection of the environment (18).

The hydrological and hydrogeological status from the point of view of quality and quantity, and their developmental identity is presented for most of the country's water districts (except for those of Macedonia and Western Peloponnese). The balance between offer and demand for water currently and in the future is estimated, and the problems, possibilities and prospects within the framework of the area's development objectives are recorded. Based on this data, proposals for policies and actions concerning the management of water resources may be formulated for each district. Moreover, the study points out inter-district relations (similarities, dependencies), in order to determine the main lines of management policies in areas with common features. Finally, the study approaches water resources management at a national level and at the same time examines to what extent sector development policies are compatible with available water resources and to what extent they contribute to an increase in the economic efficiency of water resources (18).

#### **1.3.2. Supranational and international strategic documents**

### 1.3.2.1. Ramsar Convention: 1997-2002 Strategic Plan

The mission of the international Ramsar Convention is the conservation and wise use of wetlands by national action and international co-operation as a means to achieving sustainable development throughout the world.

The 1997-2002 strategic plan is a 26-page document, adopted at the 6<sup>th</sup> Meeting of the Contracting Parties in Brisbane-Australia, in March 1996. In the introduction to the document it is stressed that there is a need to integrate the conservation of wetland biodiversity in sustainable development. The general objectives of the strategic plan are expressed below (6):

1. To progress towards universal membership of the Convention
2. To achieve the wise use of wetlands by implementing and further developing the Ramsar Wise Use Guidelines
3. To raise awareness of wetland values and functions, throughout the world and at all levels
4. To reinforce the capacity of institutions in each Contracting Party, to achieve conservation and wise use of wetlands
5. To ensure the conservation of all sites included in the list of wetlands of international importance (Ramsar List)
6. To designate for the Ramsar List those wetlands which meet the convention's criteria, especially wetland types still under-represented in the List and trans-frontier wetlands
7. To mobilise international co-operation and financial assistance for wetland conservation and wise use in collaboration with other conventions and agencies, both governmental and non-governmental
8. To provide the Convention with the required institutional mechanisms and resources

The above objectives are distinguished into operational objectives, which in turn are analysed into actions

The technical guidance of the Ramsar Convention on the one hand for a) the planning of wetland management and b) wise use, which it has given to the Contracting Parties, and on the other hand, the range of possible actions that it challenges them with, through the Strategic Plan, provide valuable orientations for the implementation of this strategy.

#### 1.3.2.2a. The MedWet initiative

The MedWet initiative commenced at the beginning of the 1990's, under the aegis of the Ramsar Convention and with the support of the European Commission, as a pilot attempt at co-operation at many levels, among governmental and non-governmental bodies and persons. The objective was to contribute to the conservation of Mediterranean wetlands.

During the Symposium that took place in Grado-Italy in 1991, it became apparent that the wise use of wetland resources, to the benefit of current and future generations, is a huge challenge and requires:

- action at all levels – local, national and regional
- co-ordinated, long-term efforts that should last at least twenty years
- participation of all those interested, i.e. international and supra-national authorities, governments, public services, Local Government, environmental organisations and individuals

For the implementation of the above, the MedWet 1 initiative was financed by the European Union (EU, LIFE) and actions were carried out in 1993 - 1996, focusing on the following sectors:

- Inventory of wetlands, mapping and monitoring, for the Mediterranean basin in particular
- Management, including the relevant legislative and administrative issues
- Training of actors involved in the management of wetlands, from decision-makers to technical field staff
- Information and public awareness
- Use of the results of scientific research for management purposes

Moreover, an international network of scientists and managers was set up, which was reinforced by links of common aspirations, trust and friendship.

In order to extend MedWet actions to five Mediterranean countries that are not members of the EU (Portugal, Spain, France, Italy and Greece participated in MedWet 1), the MedWet 2 project was initiated in 1996 with the participation of Albania, Algeria, Croatia, Morocco and Tunisia. Furthermore, a new subject was added, namely, the social and economic aspects of the use of wetland resources the objective being to improve management also.

MedWet 3, an important project, with a budget of 15.5 million dollars and with a five-year duration (1999-2003), that concerns activities in wetland and coastal systems in Albania, Egypt, Morocco, Lebanon, Palestine and Tunisia, has been approved by the Global Environmental Facility and is under implementation. These activities constitute the continuation of MedWet 1 and MedWet 2. At the moment, the corresponding national action plans are at the preparation phase and at the same time a regional structure is being developed.

MedWet 4 consists in wide co-operation during a three-year period (1998-2000) between the Biological Station of Tour du Valat, Wetlands International and EUROSITE. This project, that begun within the framework of implementation of the 1997-2002 Ramsar Strategic Plan and aims at the conservation of Mediterranean, Black Sea and Caspian Sea deltas, includes exchanges of wetland managemers.

Finally, in October 1996, in order to promote and evaluate the implementation of the Mediterranean Strategy for Wetlands, MedWetCom, a Ramsar Secretariat initiative, was set up. MedWetCom is composed of governments, the European Commission, the Bern and Barcelona Conventions and international organisations. At the second meeting of MedWetCom that took place in Valencia-Spain at the end of January 1999, the results of MedWet 2 were presented and the implementation of the Strategy for Mediterranean Wetlands was discussed.

#### 1.3.2.2b. The Strategy for Mediterranean Wetlands



This is a 18-page document that was approved by the representatives of Mediterranean countries, the Ramsar Secretariat, environmental organisations, scientific institutions etc, who participated at the Conference on Mediterranean Wetlands in June 1996 (250 specialists).

The general objective of the strategy is "to stop and reverse the loss and degradation of Mediterranean wetlands as a contribution to the conservation of biodiversity and to sustainable development in the region" (22).

The eight general objectives are to a large extent similar to those of the Ramsar Strategic Plan and those of this strategy.

### 1.3.2.3. Sustainability: European Community 5<sup>th</sup> Action Plan for policy and action for the environment and sustainable development

The 5<sup>th</sup> Action Plan seeks to achieve a more stable balance between socio-economic development on the one hand and resources and the regeneration capacity of nature on the other.

To achieve this, seven priority sectors have been defined which include sustainable management of natural resources (soil, water, natural areas and coastal zones) (9). This plan constitutes a pioneer approach to development and environment issues because:

- it focuses on activities that cause environmental degradation and the exhaustion of natural resources instead of waiting for problems to appear
- it endeavours to constitute a reason for changes in existing tendencies and practices that harm the environment so as to ensure socio-economic prosperity and development for future generations
- it aims at the achievement of these changes in social behaviour, through the fullest possible participation in accordance with the spirit of joint responsibility, of all sectors of society including Public Administration, public and private companies and the public at large
- it determines the extended means that may be used for achieving the objectives of the plan.

Furthermore, it sets the general strategic objectives (till the year 2000) for habitats, coastal zones, the quality and quantity of water and biodiversity, many of which are in progress currently.

For wetland resources in particular, a special Communication of the European Commission has been issued (see 1.3.2.4).

#### 1.3.2.4. Wise use and conservation of wetlands

This is a 59-page document, published in 1995, that constitutes a "Communication of the Commission of the European Communities to the Council and the European Parliament". The following is mentioned in its introduction:

"This Commission Communication provides a strategic basis for such a policy aiming at the sustainable use of wetland resources and the conservation of their functions and values for future generations".

Clearly, the Communication is governed by the familiar notions that had been adopted by the Contracting Parties to the Ramsar Convention, including the member states of the European Union. It should be noted that the terms wise and sustainable use are considered as synonyms.

The general objectives of EU policy for wetlands, as expressed through the communication, are (4):

- no further loss of wetland area
- no further degradation of wetlands
- wise use of wetlands
- rehabilitation and restoration of wetland functions
- international co-operation and actions that promote wise use and the conservation of wetlands

The European Commission recommends to its member-states to express their national policy for wetlands by considering this document, approved by the Council of Ministers of the European Union in 1996, as a basis.

#### 1.3.2.5. Pan-European landscape and biodiversity strategy

At the Conference "Environment for Europe" (Sofia, 24 April 1995), the ministers for the environment of 55 European countries adopted the said strategy, as an innovative approach to prevention, arrest and reversal of the process of degradation of the values of biodiversity and landscape diversity in Europe. The strategy, which also refers to Europe's support to

the Biodiversity Convention, reinforces existing measures and determines additional ones to be adopted during the coming twenty-year period.

The general objectives of the Pan-European landscape and biodiversity strategy are (7):

To substantially reduce the threats that biodiversity and landscape diversity in Europe are confronted with,

To increase their resistance and resilience,

To enhance the ecological cohesion of Europe as a whole,

To ensure participation of the public in the protection of European biodiversity and landscape diversity.

Wetland ecosystems (classified in three categories, i.e. coastal and marine ecosystems, rivers and related ecosystems, inland water ecosystems) constitute an important part of the strategy. Necessary actions, with which this strategy agrees in principle, are divided into four consecutive action plans of a five-year duration, and allowance has been made for the process through which the success of the strategy shall be evaluated.

#### 1.3.2.6. Mediterranean Conservation Strategy

This is a document that was drafted by the Secretariat of the Mediterranean Programme of the Worldwide Fund (WWF) and is accompanied by a 1996-2001 Action Plan (24). The natural environment is divided, for operational reasons, into thematic units "Forests", "Fresh water", "Seas and coastal areas". Moreover, issues that concern the environment in general, i.e. tourism, environmental economics, trade in wild life, energy and transport, agriculture and environment are also examined. For each one of the thematic units, the current situation and threats, government and sector policies, the experience of WWF and its current activities, involved and benefiting parties and the outline of the Action Plan are described. These actions are analysed in more detail and their cost is estimated in the Action Plan. Many well-timed actions that aim at the management and the protection of wetlands are discussed under thematic units "Fresh water" and "Marine and coastal areas" and are in agreement with the actions proposed in this strategy.

#### **1.3.3. Legislative acts that form strategic frameworks**

### 1.3.3.1. L. 2204/1994 ratification of an international convention on biological diversity

The international Convention on Biological Diversity was signed in Rio de Janeiro-Brasil on 5<sup>th</sup> June 1992 and was ratified by our country in April 1994. The conservation of biodiversity, sustainable use of its constituents and a fair and equal share of the advantages that will ensue from the use of genetic resources constitute its general objective (5).

The convention commits our country to many relevant obligations, such as for instance the recording of its biodiversity, the monitoring of its condition, the identification of threats, supranational co-operation wherever necessary, implementation of measures to conserve biodiversity *in-situ* and *ex-situ*, promotion of related scientific research projects, technical education and training, information and public awareness and other actions (34). Moreover, official co-operation has been established between the Convention and the Ramsar Convention for more complete handling of issues of mutual interest.

Obviously, given that wetlands are ecosystems with a rich biodiversity, many of the units of actions foreseen by the Convention directly concern wetlands. Article 6 foresees, on the one hand, the development by each contracting party, of national strategies, plans or projects for the conservation and the sustainable use of biodiversity. On the other hand, it foresees the best possible integration of conservation and the sustainable use of biodiversity in relevant sector and cross-sector plans, projects and policies.

### 1.3.3.2. Directive 92/43/EEC on the conservation of natural habitats and wild fauna and flora

Despite the steps taken by each EU country in order to protect the natural environment, the general situation of a specific number of habitats and species is deteriorating progressively and this may lead to an irreversible loss of biodiversity in the EU.

In order to prevent deterioration of the conservation status of the natural environment, Directive 92/43/EEC foresees the setting up of a European ecological network for member states of the EU. This network will comprise and will link areas in which habitats and endangered species of plants and animals are present:

the NATURA 2000 Network.

By June 2004, member states are obliged to specify officially areas selected as Special Areas of Conservation, for the European Ecological Network NATURA 2000. At the same time, special management plans are being drafted for each area. The Directive states that each member-state of the EU is responsible for the conservation of natural types of habitats and species together with their niches, which are mentioned in Annex I and II to the Directive, to a satisfactory degree of conservation by the institution of special management measures. The design and implementation of these measures should proceed with the informed participation and the consent of local bodies and those who are interested directly (1, 30).

All wetlands of international importance situated on Greek territory, and many other wetland areas that include types of wetland and species quoted in the Directive, have been included in the national list proposed by our country.

#### 1.3.3.3. Directive 79/409/EEC on the conservation of wild birds

This Directive concerns the conservation of all species of wild birds that live and move within European territory and deals with their protection and management.

It approaches the conservation of birds as a contribution to the fulfilment of Community objectives for the improvement of the quality of life, harmonious economic development throughout the Community and the consideration of European space as a continuous entity. Moreover, the protection measures that it proposes are placed in a broader natural resources protection and management framework. Thus, the following are foreseen (29):

- the preservation, conservation or rehabilitation of their biotopes
- special conservation measures that concern the biotope of annex I species (those that are in most need of protection), and migratory species that are encountered often
- the creation of a network of Special Protection Areas (SPAs), in which member states are obliged to guarantee the integrity and safeguard of bird biotopes

- the prohibition to kill, capture and hold birds, destroy nests, collect and hold eggs and intentional disturbance, particularly during the breeding period
- the prohibition of trade in live or dead birds and parts of them
- special regulations for hunting

The need to protect wetlands, particularly those of international importance, is mentioned specifically (article 4, par. 2). All our country's SPAs (52 areas) are included on the national list of areas that constitute the NATURA 2000 Network. In general, it can be said that the vast majority of important Greek wetlands, together with the species and the habitats that they include, whether of international importance or not, have been placed on the list of areas that are candidates for inclusion in the Network.

*1.3.3.4. Council Regulation 2078/92 on agricultural production methods compatible with the requirements of the protection of the environment and the maintenance of the countryside*

The way in which agricultural activities are carried out and especially certain intensive methods of production that have been used during the past decades, cause serious problems such as the degradation of soils, pollution and over-use of water resources, and a decrease in biodiversity.

The Council Regulation 2078/92 foresees the implementation of projects that encourage farmers to apply environmentally friendly agricultural production and farming methods (31).

These projects foresee economic support for farmers who wish to participate in them. Methods and practices that the Regulation considers environmentally friendly (and supports financially), are determined as follows:

- Important reduction in the use of fertilisers and agricultural pesticides
- Extensive cultivation and production of fodder
- Extensive animal production
- Production methods that contribute to the protection of the environment & natural resources, conservation of natural space and the rural landscape
- Preservation of abandoned land
- Long-term set-aside
- Management of land for public use and access by the public

- Awareness and training for farmers on matters related to the implementation of the Regulation

Clearly, the implementation of the above agri-environmental measures in areas surrounding wetlands, and in the wider hydrological basin, can contribute to a large degree to reducing degradation caused by agricultural activities. The Ministry of Agriculture has submitted already to the EU, a draft proposal for a project aimed at the protection of particularly important wetlands (NATURA 2000 Network areas).

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#### **1.4. General principles of the national strategy for wetland resources**

The strategy should be governed by certain basic principles (11, 7) that are formulated below. These principles ensue from objective conclusions of scientific research, and the laws that bind the Greek State and pre-existing policy documents. The National Strategy should be compatible with these documents but it should moreover respond to the specific aspirations and needs of Greek society.

1.4.1. Wetlands are collective social assets. Their management is not a matter that concerns their owner exclusively (e.g. state, local government body, co-operative, private individual) but is determined by their character as collective social assets.

1.4.2. The conservation of wetlands as collective social assets is a basic constitutional order and it is the State's responsibility, within the framework of conservation of the natural environment.

1.4.3. No other wetland area should be sacrificed in the future because Greece has lost two thirds of its wetland area already during the twentieth century (13). In cases where it is economically and technically feasible, efforts to rehabilitate, restore or create wetlands should be made in order to setoff the losses.

1.4.4. Sustainable management of wetlands may be achieved only through the integration of the protection of natural resources in general, and wetland resources in particular, in sectorial development policies for the primary, secondary and tertiary sector.

1.4.5. Certain competencies related to management and promotion can be transferred by the State through contracts with non-governmental public utility type bodies, provided the broadest possible participation and public interest are guaranteed.

1.4.6. Continuous demographic decline in rural areas is one of the most serious problems confronted by the nation today. For this reason, management measures required for the conservation of a wetland should not affect the lawful financial interests of local inhabitants but, on the contrary, should include measures to increase their income and improve their quality of life.

1.4.7. Wetlands cannot be protected without being used, nor can they be used forever without being protected from unwise methods of production and radical changes in land-use. Certainly, the economic values of small parts of wetland should (for scientific and conservation reasons and for the regeneration of certain species etc) be excluded from any use.

1.4.8. Wetland systems, just like any other natural systems, should not be considered as isolated ecosystems that are not affected by the surrounding area, but as sub-systems of a broader system that is governed by a single management philosophy. Consequently, various factors such as sustainable practice of human activities in the peripheral zone, the hydrological basin or the wider area, the conservation of groups of wetlands, their size and the distance between them etc, play an important role in the conservation of their functions and values as a whole.

1.4.9. Wetlands are dynamic systems that evolved and continue to evolve along with the presence of Man and the way in which Man has used them. Modern technology has offered people ways of using wetlands that are threatening to them. But technology could offer methods of sustainable use.

1.4.10. The conservation of biodiversity cannot be achieved if efforts concentrate on levels of life organisation below that of the ecosystem. All efforts to conserve a species or a group of species should be incorporated in an integrated effort that includes the entire wetland system and, ideally, the entire hydrological basin. Moreover, the conservation of wetland



biodiversity may be promoted in the long run through a network of wetlands that are managed in a sustainable way only.

1.4.11. Great differences exist as to the level of scientific knowledge (both in Greece and internationally) on the various wetland issues. Areas in which knowledge is insufficient are not fully known. Therefore, a special study is necessary to identify deficiencies and propose improvement in knowledge, training and broader diffusion of knowledge. The input of knowledge and experience from other countries cannot but be considered as an aid to the development of Greek know-how and not as a substitute for it.

1.4.12. Knowledge and experience gained about the sustainable management of a wetland should be diffused rapidly in order to avoid the same mistakes and save time and money. Apart from this, scientific networking of wetlands contributes to correct choices as regards management and development. Networking should be even more efficient between wetlands that are part of a wider geographical functional web.

1.4.13. The creation, rehabilitation and restoration of wetland functions are not necessary only in order to mitigate mistakes of the past and increase the national wetland capital. They yield other just as important benefits, e.g. increase in our knowledge of the natural functions of wetlands, creation of new employment opportunities, a "tool" for making the public aware of all wetland values.

1.4.14. The creation of a certain type of co-ordination body is one of the preconditions for achieving efficient co-ordination. The structure and operation of the body will differ from one wetland to another, but in no case should it be rigid and bureaucratic. The body should be comprised of representatives of organisations that are involved in management (which, in general, should maintain their competencies), users and other interested parties if participation of the latter is deemed necessary for specific matters.

1.4.15. Social support for measures to protect wetlands should be sought, through information and awareness campaigns about wetland values for the general public and specific social groups. However, whereas this way of promoting the sustainable management of wetland resources may bring

about very positive results for certain social groups, for others, e.g. user groups, effectiveness is limited and should not be overestimated. The user who is aware will cease to care if he is not furnished with sufficient technical assistance and even specific financial support for him to adopt sustainable practices.

1.4.16. A forecast of the trends that ecological changes in Greek wetlands will follow may save resources that will be needed in the future for remedial measures. Apart from a few research efforts that have been made in certain deltas, Greek society knows nothing about the natural changes that lakes and coastal ecosystems will undergo during the next decades. Moreover, no predictions have been made about the effects of new human activities that are likely to develop in a few years (e.g. possible drastic increase in the number of visitors along the coastline of Macedonia and Thrace).

1.4.17. Various forms of participation of environmental NGOs (whose actions are based on a sound scientific basis) in matters of planning and implementation of positive actions and the determent from unwise actions are important and may be rendered even more effective.

1.4.18. The problems of a wetland cannot and should not be isolated from local, regional, national and international problems that concern the use of water and soils and the employment of human resources, especially in rural areas.

1.4.19. Development projects and activities that are expected to have impact on wetlands should be examined as to their utility and should follow the relevant processes of preliminary authorisation and Environmental Impact Assessment. Even if the ways in which the said projects cause this impact cannot be determined precisely, appropriate mitigating measures should be taken.

1.4.20. Alternative sites should be chosen for the execution of projects that are likely to affect important wetlands, so that these wetlands may not be threatened by alterations. In areas where the proposed projects constitute a primary national requirement and where ecological damage is unavoidable, appropriate protection measures should be taken to counterbalance the adverse impact.

1.4.21. The cost of prevention and control measures and measures to reduce adverse impact, and the responsibility and the cost of remedying ecological damage that has occurred already, should burden the person who is liable.

## **2. NATIONAL STRATEGY OBJECTIVES**

### **2.1. General objective of the national strategy for wetland resources**

The general objective of the strategy is:

To achieve conservation and rehabilitation of all functions and values of the wetland resources of Greece as a contribution to the sustainable development of the country.

### **2.2 Specific objectives**

The above general objective is analysed into specific objectives as follows:

1. Designation of the most important wetlands of the country as protected areas and their management
2. Prevention of wetland degradation resulting from projects and activities
3. Implementation of sustainable management practices in all wetlands of the country – rehabilitation and restoration of wetlands
4. Sustainable management of water resources in the hydrological basins of wetlands and in small islands
5. Promotion of scientific research on wetland management and dissemination of research results
6. Investigation and application of economic incentives for the conservation of wetlands
7. Monitoring of important parameters for wetland management - inventory
8. Information, environmental education and awareness about wetlands
9. International co-operation in topics of wetland resources management

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## **3. ACTIONS REQUIRED AT A NATIONAL LEVEL TO FULFILL THE OBJECTIVES**

The actions foreseen by this strategy concern all Greek wetlands. However, priorities shall be set when implementation begins. Thus, priority shall be given to wetlands of international importance, then to the other important wetlands included in the NATURA 2000 Network and finally to the rest of the wetlands. The first action that should be undertaken for this last group of wetlands is their delineation.

Two degrees of priority are given to the actions foreseen by this strategy: immediate (I) or medium-term (?). In many cases, it is not easy to attribute one or the other degree of priority. In this case, actions are characterised as I-M. However, it should

be made clear that the conservation of all the country's wetlands is urgent. Within the framework of nature conservation policy, all actions are of highest priority.

### **3.1. Specific objective 1: Designation of the most important wetlands of the country as protected areas and their management**

Necessity and expected benefits: The country's moral and legal obligation to protect wetland ecosystems, which it has itself suggested to the Greek, European and international community as being ecologically important and in need of protection and specific management, is justified. The institution of protected areas and all parallel – ensuing procedures (establishment of management bodies, training of those interested, elaboration and adoption of management plans, limitations or change in localisation of human activities, provision of incentives for sustainable practices etc), through procedures of participation and considering the needs of local communities, constitute very important steps towards the conservation and sustainable management of wetland ecosystems.

#### Required actions:

1. Determination of special evaluation criteria for wetland areas by adapting existing criteria (e.g. Ramsar Convention, NATURA 2000 Network, IUCN), so as to set priorities for their designation as protected areas and for classifying them into the various categories of protected areas. Scheduling of procedures required for institutionalisation (I), according to priorities
2. Prepare the ground for legal protection of important wetlands whose ecological value is insufficiently documented (I).
3. Implementation of measures and regulations that are determined by legislative acts (JMD or PD) (I).
4. Elaboration of management plans (including those related to the management of monitoring programmes) for all important wetlands in accordance with the specifications set by the Ministry for the Environment, Physical Planning and Public Works (I).
5. Promotion and initiation of the implementation of measures that are determined in approved management plans, through the ratification of necessary legislative regulations and the necessary inter-service and intra-service administrative arrangements (I).

6. Increase human resources and improve the technical infrastructure of the Information Centres of the Ministry of Environment, which operate in protected wetlands and establishment of new ones wherever deemed necessary (I-M).
7. Implementation of monitoring programmes for a. selected biotic or/and abiotic parameters, using methods and applying the periodicity determined by experts for each area, according to the objectives of monitoring and b. the threats for each protected wetland (I).
8. Elaboration of national action plans for threatened wetland species, considering the broader plans of action for endangered species. These plans will be updated and reviewed at regular intervals (M).
9. Creation, staffing and equipment of co-ordination bodies for the management of wetlands, of local or regional range (I).
10. Implementation of theoretical and technical training programmes for managers of management co-ordination bodies and all those who are to be involved in the application of management and monitoring measures (I).
11. Establishment of mechanisms to facilitate communication between those involved in wetland management (management co-ordination bodies, local bodies, interested social groups) and environmental NGOs and the public, on matters that concern the design and the implementation of management measures (I-M).
12. Scientific and technical support for monitoring actions in wetlands in which management co-ordination bodies have been set up or are about to commence operation, by advising those involved about the priorities for each region, providing relevant documentation and organising training programmes in management and monitoring techniques.(I), e.g.
  - 12a. Organisation of training programmes and supply of necessary equipment to the personnel of the Information Centres of protected wetlands, in order for them to carry out management and monitoring actions (or to aid in their implementation) in their areas, within the framework of management of these areas
  - 12b. Organisation of training programmes for foresters and other guarding personnel so that they may help in monitoring selected parameters in the field, while at the same time carrying out their other duties
13. Use of financial means and new scientific and technological findings for the elaboration of pilot application projects for sustainable management measures for wetland resources (I).

14. Use of models of the evolution of important wetlands (that are the product of research) (M) for the elaboration and implementation of management plans for wetland areas (M).

15. Establishment of a national committee for wetlands (within the framework of the wider committee for the ecologically important areas of Greece) and determination of the way in which it will function (I).

### **3.2. Specific objective 2: Prevention of wetland degradation resulting from projects and activities**

Necessity and expected benefits: Wetlands are dynamic systems and therefore, their evolution is affected both by natural and (especially) human activities (drainage, embankment and diversion of rivers, construction of dams, clearing-deforestation, non-sustainable agricultural, farming, fishing and aquaculture practices etc.). The deeper causes of these changes in the past are, of course, due to short-sighted, non-integrated policies that were in force for many decades. Efforts to integrate the environmental dimension in all policies have commenced but are proceeding at a slow pace and encounter many obstacles. Monitoring threats to wetlands, the objective being early identification or prevention of adverse natural processes or (more often) human activities, is of crucial importance for the prevention of further degradation (2). Monitoring of dangers that threaten wetlands should be carried out in the field (where changes are observed and adverse actions are identified) and at the planning level of human activities. Due to the lack of resources, monitoring of threats at the decision-making and planning level should be preferred however difficult this may be. When changes are observed in the field it is often too late for any important remedial intervention (10). Moreover, the monitoring of threats completes the monitoring of biotic and abiotic elements in each wetland and provides a better understanding of recorded changes.

#### Required actions:

1. Implementation of a programme for monitoring threats to selected wetlands, and inventory of threats (I):

1a. during the policy formulation and decision-making phase (examples of parameters: progress of socio-economic policies, effectiveness of the Environmental Impact Assessment procedure, allocation of budgets to central and local services, drafting of work programmes for services responsible for environmental planning)

1b. during the field implementation phase, causes and results, with particular attention to development activities, of selected environmental parameters and for indicative ecological changes

1c. continuous monitoring of the results of development activities and the results of monitoring during phases 1a. and 1b. (see above), in order to determine the necessary offset measures.

2a. Creation and periodic updating of archives, at the Regional level (and Local Government in the cases that very important wetlands are situated within its administrative limits), composed of studies, unpublished reports, bibliography and other information material about wetlands (or natural areas in general) situated within the administrative boundaries of the Region or the Prefecture (I-M).

2b. Drafting and updating a mailing list for recipients of relevant information, bibliography, unpublished reports and other material, by administrative Region and perhaps by Prefecture (I-M).

2c. Informing all interested services about the existence of studies, etc. archives (I-M).

3. Support institutions that deal with wetland matters so that they may be able to contribute as much as possible to the protection of wetlands, including the identification of dangers and the prevention of degradation (I-M)

4. Organisation of training and further education programmes for high-rank staff of civil services involved in the management of wetlands, on wetland sustainable management issues (I).

5. Organisation of special training programmes on environmental impact assessment methods and evaluation of Environmental Impact Statements for the staff of Regional and Prefectural services, who are responsible for assessing EIA that concern wetland and other natural areas (I).

6. Organisation of training programmes for users of wetland resources, on sustainable use issues, at a theoretical level, and provision of special knowledge about the implementation of sustainable practices. Sustainable agriculture in the hydrological basins of important wetlands and saving of irrigation water should be considered as a first priority (I).

7. Organisation of training programmes and provision of necessary equipment to the personnel of the Information Centres of the protected wetlands, responsible foresters or other guards, and to environmental NGOs, in order for them to carry out threat monitoring actions (or to help in their

implementation) in their areas of competence and within the framework of management of these areas.

8. For development plans that concern hydroelectric, irrigation and flood prevention projects, ensure a. sufficient information about the necessity of the projects, b. minimum supply of water and water quality for the conservation of downstream ecosystems, especially delta ecosystems, c. appropriate supply of transported material that is necessary for the conservation of the structure of downstream ecosystems and d. free upstream movement of species of fish (I)

9. Ensuring correct evaluation of the environmental impact of projects that affect wetlands and reliable evaluation of relevant Environmental Impact Assessment (EIA) (I).

10. Adoption of conclusions that ensue from the operation of the institution of EIA as regards the cumulative effects on wetlands of development projects and activities, for drafting management plans for wetland areas and issuing environmental terms upon approval of the EIA (I).

11. Monitoring of the degree to which, the adoption of imposed environmental terms is supervised, during construction and operation of development projects that have been approved by EIA, by setting up an INSPECTORATE (I).

12. Broad diffusion (to those involved in the management of wetlands, social groups, the public and environmental NGOs), of a printed guide on the legal protection of wetlands, presenting in a simple way the manner in which existing legal tools for the protection of wetlands are used, including tools that are not covered by specific PDs or JMDs (I).

### **3.3. Specific objective 3: Implementation of sustainable management practices in all wetlands of the country – rehabilitation and restoration of wetlands**

Necessity and expected benefits: Wetlands are one of the most threatened ecosystems, particularly in geographical regions where water is a scarce resource, such as the Mediterranean. Moreover, they are sources of remarkable biodiversity, which our country has committed itself to protect. Upon signature of the Ramsar Convention, our country undertook the commitment to manage all wetlands existing on its territory, and not only those that Greece has included on the list of wetlands of international importance, in a sustainable way. This commitment is reinforced by national legislation and related community acts. Moreover, the creation of artificial wetlands and the rehabilitation and restoration of wetland functions\* counterbalance, to some degree, their continuous loss and degradation due to human intervention, and at the same time they represent a model of positive



interaction between Man and the natural environment (25). These types of undertakings greatly promote scientific knowledge and at the same time offer excellent opportunities for the implementation of monitoring and public awareness programmes, environmental education, training on technical matters, scientific research, socio-economic case studies, re-allocation of land and change in land-use, change of crop patterns, Regulation 2078/92 programmes, sustainable management pilot projects and supra-national co-operation.

Necessary actions:

1. Creation, staffing and equipment for wetland management co-ordination bodies, with local or regional competence (I).
2. Implementation of theoretical and technical training programmes for the personnel of management co-ordination bodies, and for all those who are to be involved in the implementation of management and monitoring measures (I).
3. Establishment of schemes and routes for facilitating communication between those involved in the management of wetlands (management co-ordination bodies, local actors, interested social groups), environmental NGOs and the public, on issues that concern the design and implementation of management measures (I-M).
4. Support of institutions that are involved in wetland matters so that they may contribute as much as possible to the sustainable management of wetlands (I-M)
5. Organisation of training programmes for foresters and other guarding personnel so that they may assist in the monitoring of threats and other parameters in the field, at the same time as practising their other duties (I-M)
6. Promotion of co-operation between Local Government bodies, Regions, environmental NGOs, development agencies, educational institutions, for carrying out training programmes on the sustainable management of wetlands (M).
7. Training of active members of environmental NGOs on the implementation of activities that are necessary for the management and monitoring of wetlands (M).
8. Scientific and technical support for Local Government and the Regions, for their participation in EU programmes (drafting of proposals, co-ordination and supervision) that concern the sustainable management of wetland resources (I-M).

9. Management and development planning for water resources at the hydrological basin and the water district level, taking into account the zoning of uses/protection and appropriate management measures for wetlands existing within them (I).
10. Integration of the concept of terrestrial ecosystem quality of the hydrological basins in the rationale of sustainable management of wetland resources. This concept includes the protection of biodiversity in the soil and above it, the environment (water and air) and the quality of life for people and animals.
11. Use of models on the evolution of important wetlands (that are the result of research) in the elaboration and implementation of management plans for wetland areas (M).
12. Recording and evaluation of measures that are unfavourable for wetlands (institutional, administrative, economic etc.), which are scattered throughout environmental legislation and their improvement. Institutionalisation of the obligation to remedy ecological damage to wetland areas by whoever causes the damage (I).
13. Elaboration of feasibility studies for the creation, rehabilitation or restoration of wetland functions for which a relevant request is made by the local society or those for which the State decides that it is necessary that they be re-created, due to their important ecological values (I).
14. Elaboration of necessary studies (pre-approval of location, Environmental Impact Assessment) for selected sites where projects are to be implemented (I).
15. Elaboration of final studies for each case, with compulsory provision for monitoring parameters that are necessary for the evaluation of the success of the project and the accuracy of initial planning. Monitoring should start at the design stage of the project, which should be sufficiently flexible in order to allow for adjustments indicated by monitoring (I-M).
16. Examination of possible ways of financing the relevant studies and projects and submission of relevant proposals by Local Government services and bodies, within the framework of related financial instruments (I-M).
17. Integration of plans for the creation, rehabilitation and restoration of wetland functions in broader local or regional sustainable management plans, compatible with other strategic protection and wise management of natural resources frameworks, such as e.g. the NATURA 2000 Network, Regulation 2078/92 (I-M).

18. Combination of cases of rehabilitation and restoration with the redistribution and change in land-use in peripheral zones, the objective being sustainable management and Regulation 2078/92 application projects in the corresponding hydrological basins (I-M).

19. Maximum exploitation of all cases of creation, rehabilitation and restoration, through extensive scientific research and surveying, monitoring programmes, elaboration of relevant post-graduate dissertations and doctoral theses, environmental education programmes, promotion through the Mass Media, public information and awareness programmes and other actions that can help to protect the wetlands in general (M).

20. Exploitation of the conclusions of research (and pilot application programmes) concerning the preconditions and specifications for the rehabilitation, restoration and creation of wetlands, in corresponding implementation programmes for such projects (I).

21. Establishment of a national committee for wetlands (within the framework of the broader committee for ecologically important areas of Greece) and determination of the way in which it shall operate (I).

#### **3.4. Specific objective 4: Integrated management of water resources in the hydrological basins of wetlands and in small islands**

Necessity and expected benefits: International experience has shown that sustainable management of wetlands and long-term protection is possible only through their consideration at the level of the hydrological basin and not within the narrow limits of purely wetland or adjacent territory. All human activities and interventions within the hydrological basin of each wetland (primary production activities, housing and tourist development, road works etc) affect its natural functions and its qualitative and quantitative features. Therefore, only an integrated and general view and management of these activities can protect them. For small islands, in particular, in which there is usually a shortage of water during the summer months, management of valuable water resources (which in this case refers to the entire island) should be designed and implemented with particular care. This is so, because their ecological importance is remarkable and the economic viability of local human populations is of great national importance.

#### Necessary actions:

1. Organisation, institutionalisation and staffing of management agencies for water resources at the water district level, throughout the territory. These agencies should be capable to intervene

substantially and act in the field, e.g. monitoring of water quality and quantity, and shall function within the framework of implementation of the new national policy for water resources that is being formulated, which in turn shall be based on the EU Water Framework Directive (I-M).

2. Co-operation between all water management structures or agencies, current or future, and management bodies for protected areas, the objective being greatest possible integration of the ecological factor in water management (I-M).

3. Support institutions that deal with wetland issues and island ecosystems so that they may contribute as much as possible to sustainable management (I-M)

4. Organisation of training programmes for users of water resources in the hydrological basin, on issues of sustainable water management, at a theoretical and practical level. (I).

5. Management and development planning for water resources at the hydrological basin and the water district level, considering the zoning of uses-protection and required management measures for wetlands situated in them (I).

6. Definition of special zones with specific special management for each one, the objective being at the same time restoration of wetland functions (e.g. improvement of water quality, reduction of brought materials etc), in whichever wetlands this is deemed suitable or necessary (M).

7. Ensuring minimum water requirements for the conservation of wetlands by exploiting information that ensues from the evaluation of the water balance at the hydrological basin level and by adapting water consumption accordingly (I).

8. Estimation of the availability of water in small islands and plan its use in relation to the needs of the population during the year and particularly during the tourist period, with particular attention to availability limits (I).

9. Saving of water resources and replenishment of underground aquifers of small islands through special works, e.g. small lake-reservoirs on sites that have a suitable geological or artificial substrate for the retention of water (I).

10. Planning and control of drilling in order to avoid the degradation of water quality due to salinisation (I).

### **3.5. Specific objective 5: Promotion of scientific research on wetland management and dissemination of research results**

Necessity and expected benefits: Current scientific and technical knowledge about wetlands covers the various ecological issues and wetland functions to different degrees. However, wetland issues are complex by nature and knowledge about the multiple interactions of biotic and abiotic elements of wetland ecosystems and their results on the quality of wetlands is absolutely necessary. Moreover, further scientific knowledge in relatively new fields, such as general and economic appraisal of wetland values, the evaluation of social parameters that affect management, the prerequisites and the specifications for rehabilitation, restoration or creation of wetlands and monitoring is necessary. An interdisciplinary approach and the enrichment of scientific and technical knowledge will provide valuable tools for management practices employed currently in wetlands, and ensure the fulfilment of the other objectives of this strategy.

Scientific and technical knowledge in the form of Greek or foreign language material (in printed or electronic form), concerning the functions and the management of wetlands should reach those who need it, to the extent, the quantity and the form necessary. People who need such information are primarily civil service officials or those of other bodies who are involved in the management of wetlands and secondly the users of wetland resources and their hydrological basins. This means that in certain cases there will be a need for the necessary equipment and training of personnel, which is to use the information. The organisation, within and between services that are responsible for wetlands, of a systematic mechanism for diffusing information and knowledge together with a feedback system would improve greatly the flow of knowledge and information to the benefit of the sustainable management of wetlands.

#### Required actions:

1. Research and application programmes on the sustainable management of wetlands and the resources of their hydrological basins (I).

The following subjects are mentioned as an example (23):

- Wetland hydrology (fluctuation of the water level, water balance, rate of water renewal, frequency of extreme conditions, water quality, creation of models for water resources at the hydrological basin or water district level)
- Soil studies in the wider wetland areas (detailed inventory of wetland soils, evaluation of conditions in wetland hydrological basins, relationships between hydrological conditions and soil processes) and soil ecology
- Wetland vegetation (qualitative and quantitative inventory of vegetation, use of aquatic vegetation a. by fish, terrestrial wild vertebrates and grazing farm animals and b. for the retention of pollutants from the hydrological basin, management of reed beds)

- Production of agricultural plants (detailed mapping of agricultural land neighbouring wetlands, relationships between rural and wetland ecosystems)
- Rearing of farm animals (evaluation of pasture activities, grazing capacity of Greek wetlands, effect of grazing on wetland functions, possibilities to preserve genetic material, use of farm animals as a means for managing wetland vegetation)
- Fisheries (colonisation of coastal lagoons by juvenile fish, breeding period of commercial species, identification of threatened species, mapping of their territory and evaluation of threats)
- Culture (architectural heritage, traditional vessels and fishing tools and production techniques, history and folklore of wetland areas, traditional wetland management techniques)
- Tertiary sector (evaluation of foreign experience, trends as regards the presence of visitors, mechanisms for controlling the number of visits and other activities)
- Ecological requirements (water) of types of ecosystems throughout the year
- Relationship of these requirements with available water resources and activities practised (agriculture, farming, fishing)
- Particular ecological requirements of Directive 92/43 wetland habitats and species
- Particular ecological requirements for the conservation of coastal and island ecosystems, those of inland lakes and birds of Directive 79/409
- Biodiversity of wetland areas (species, populations, spatial location, use of habitats) and their value for Man

2. Study of natural processes that alter wetland ecosystems (riverbed erosion, sedimentation, eutrophication), determination of consequences on - a. the abiotic and biotic part of the wetland systems and b. the local and broader society and economy - through case studies chosen according to how representative and how important the type of wetland is (M).

3. Elaboration of models of the natural evolution of important wetlands through time(M).

4. Support of institutions that are involved in research on wetland issues so that they may contribute as much as possible to filling the gaps in scientific knowledge on the particular subjects (I-M)

5. Creation of a basis for monitoring wetlands (inventory of basic data, determination of the reaction of biological indicators to environmental distress parameters, evaluation of results through experimental application of monitoring methods, etc.) (I).

6. Determination of long-term and cumulative impact on wetlands from development projects and activities, through the process of EIA (I).

7. Exploitation of management, rehabilitation, restoration plans and plans for the creation of wetlands, in research projects (M).

8. Research on the prerequisites and the specifications and the acquisition of knowledge regarding the rehabilitation, restoration and creation of wetlands (I).

9. Maximum exploitation of all cases of creation, rehabilitation and restoration, through extensive scientific and case studies, monitoring programmes, post-graduate dissertations and doctoral theses, environmental education programmes, promotion by the Mass Media, public information and awareness campaigns and other actions that assist in the protection of wetlands in general (M).

10. Use of methods to evaluate economic and social parameters that are determining for the protection of wetland areas in surveys and case studies (I).

11. Incorporation of courses on ecology and management of wetlands in undergraduate and postgraduate courses of relevant University Faculties and updating-improvement of existing ones (I-M).

12. Organisation of special training programmes on methods of environmental impact assessment and evaluation of EIA studies for the personnel of services that are responsible for judging EIAs that concern wetland areas and other natural areas (I).

13. Organisation of training and further education programmes for civil service personnel that is involved in the management of wetlands, on issues of sustainable management of wetlands (I).

14. Organisation of training programmes for users of wetland resources, on issues of sustainable management, at a theoretical level and by providing special knowledge about the application of sustainable practices. Sustainable agriculture in the hydrological basins of important wetlands and saving of irrigation water should be considered as first priority (I).

15. Scientific and technical support for monitoring actions in wetlands in which management co-ordination bodies have been or will be set up, by advising those involved about the priorities in each region, provision of relevant documentation and organisation of training programmes on management and monitoring techniques (I), e.g.

15a. Organisation of training programmes and provision of necessary equipment to the personnel of the Information Centres of protected areas so that they may implement management and monitoring actions (or assist in their implementation) in their areas of responsibility, within the framework of managing these areas

15b. Organisation of training programmes for foresters and other guarding personnel so that they may assist in the monitoring of selected parameters in the field at the same time as exercising their other duties

16. Organisation of working meetings and training programmes in order to address scientific issues and problems that concern specific cases of creation, rehabilitation and restoration of wetland functions, with the participation of specialised scientists and administrative bodies (M).

17. Review of existing scientific knowledge and know-how on matters of creation, rehabilitation and restoration of wetlands in order to select Greek language material (in printed or electronic form) that should be forwarded to specific recipients, as a rule the personnel of services that are responsible for wetlands (I-M).

18. Collection, filing and diffusion of current international literature and unpublished reports concerning cases of management, rehabilitation, restoration and creation of wetlands, selection of foreign language material, reproduction and dispatch to recipients who are in a position to exploit the material (M).

19. Translation of foreign language material (such as e.g. a. the Wise Use Guidelines, b. Management Planning Guidelines, c. definitions of the ecological character of wetlands and of its change, (as determined by the Ramsar Convention), publication in Greek of selected items, and dispatch to those interested (I-M).

20. Connection to the Internet of as many competent public services as possible (at central, regional and local level) and training of personnel on its use for inter-service communication, the search for information and bibliography (M).

### **3.6. Specific objective 6: Study and use of economic incentives for the conservation of wetlands**

Necessity and expected benefits: Currently, Greek rural areas are afflicted by high unemployment and it is difficult to maintain the population in these areas. The average age of this population is high. On the contrary, large urban centres are growing continuously with all the known adverse consequences. For these reasons, measures to provide economic incentives and improve the quality of life in rural areas will encourage young people in particular to remain in rural areas or to move to them. Wetlands and their peripheral zones in the corresponding hydrological basins support production activities of the primary sector: farming, fishing and aquaculture. Effective support of the sustainable practice of these activities and others that are compatible with protection activities (e.g. eco-tourism) perhaps will have a dual positive result. On the one hand it will contribute to the sustainability of the wetland system in general and on the other hand it will create a local renewed or totally new employment opportunity. This is particularly important because it is now fully acceptable that the conservation of human resources contributes to the



conservation of wetland resources in a decisive way. In the wider areas of wetlands, development should be compatible with protection. Special financial provisions, i.e. by providing alternative sources of income should offset any losses of income for specific social groups resulting from the application of regulatory provisions.

Required actions:

1. Examination of all possible ways in which the agri-environmental Regulation 2078/92/EC on environmentally friendly agriculture, and the relevant regulations that are being drafted, can contribute to the fulfilment of the above specific objective (I).
2. Acceleration of the application of Regulation 2078/92/EC and priority to the peripheral zones of important wetlands for the application of Regulation 2078/92/EC (I).
3. Promotion and support (financial, through training programmers for farmers and information about the sale of products) for practising environmentally friendly agriculture near wetlands and in the wider hydrological basin (I-M).
4. Information and awareness campaigns-programmes on the need to conserve wetland values, oriented towards the creation or increase of the market for environmentally friendly agricultural products and other local products (I-M).
5. Promotion of environmentally friendly eco-tourism companies –activities in wetland areas or areas neighbouring on wetlands and provision of correct guidance and training to individuals or legal entities who wish to be involved in these activities (I-M).
6. Promotion and support (financial and through information and awareness programmes, and training of fishermen and aquaculturers) of sustainable fishery and aquaculture practices in wetlands (I-M).
7. Promotion of sustainable farming practices in the hydrological basins of important wetlands following the elaboration of relevant studies (I-M).
8. European market research for enterprises-activities related to scientific and outdoor tourism in wetland areas with important biodiversity or particular biotic features e.g. in areas with rare species of birds and other species of animals, rare and endemic species of plants, interesting plant communities (M).

9. Examination of ways in which to finance and support financially local traditional agricultural, fishing and aquaculture practices, and the production and promotion of local products (textiles, wood carving, objects and furniture made of rattan and bamboo, ceramics, food, pastries, drinks) in the local and wider market (M).

10. Use of methods to evaluate the economic and social parameters that are determining for the protection of wetland areas in development studies and programmes that concern wetlands (I).

11. Exploitation of financial instruments and new scientific and technological findings for the elaboration of pilot programmes in order to apply sustainable management measures for wetland resources (I).

### **3.7. Specific objective 7: Monitoring of important parameters for wetland management - inventory**

Necessity and expected benefits: Monitoring is an integral tool of any properly prepared management plan for a protected area. Monitoring provides a feedback to the management plan and it is a guide for amendments aimed at coming closer to the achievement of ideal management objectives. A monitoring programme should be designed according to specific logical steps. The determination of its objective plays a crucial role because data that is collected without a strictly determined objective does not serve any management objective and cannot contribute to the improvement of management. Correct selection of parameters or indicators (physical, chemical, biological, others) to be monitored can contribute to an economic appraisal and continuous improvement of the management of an area (2).

A wetland inventory constitutes the first and basic step for the protection of wetlands because it offers the most important basis of information at a national level, as regards the number, the area, the type, the situation in which wetlands are and decision-making in the field of environment and development. On the other hand, periodic updating offers a valuable picture of the evolution of wetlands through time.

#### Required actions:

1. Establishment of a basis for monitoring wetlands (recording of basic data, determination of the response of bio-indicators to environmental stress parameters, evaluation of results obtained from the experimental application of monitoring methods) (I).

2. Implementation of monitoring programmes for selected biotic and abiotic parameters using methods and a periodicity that have been determined in accordance with the special monitoring requirements of each area (I).

3. Implementation of monitoring programmes for avifauna given that it constitutes an important indicator of the situation of the wetlands that host it (I).

4. In-depth study of the possibilities of using Geographical Information Systems and remote sensing for managing wetland resources and use of these possibilities for the management and monitoring of wetlands (I-M).

5. Scientific and technical support for monitoring actions in wetlands in which management co-ordination bodies have been set up or are to be set up, by advising involved persons about the priorities for each area, provision of relevant documentation and organisation of training programmes in management and monitoring techniques (I), e.g.

5a. Organisation of training programmes and provision of necessary equipment to the personnel of the Information Centres of protected areas so that they may implement management and monitoring actions (or assist in their implementation) in their areas of responsibility, within the framework of area management (I).

5b. Organisation of training programmes for foresters and other guarding personnel so that they may assist in the monitoring of selected parameters in the field at the same time as practising their other duties (I-M).

6. Co-operation among and co-ordination of all services and bodies that in one or the other way are responsible for monitoring wetlands or particular wetland features in order to ensure maximum possible exploitation of the information that monitoring offers (I).

7. Support institutions that deal with wetland matters so that they might contribute as much as possible to the sustainable management of wetlands, in particular in the areas of monitoring and inventorying (I-M)

8. Monitoring of the degree to which imposed environmental terms are adopted, during the construction and operation of development projects that have been approved by EIA, through the selection and monitoring of special indicators (I).

9a. Creation and periodic updating of archives, at the Regional level (and that of the Prefecture and Local Government if very important wetlands are situated within their

administrative boundaries), containing studies, unpublished reports, bibliography and other information material on wetlands (or natural areas in general) situated within the administrative boundaries of the Region or the Prefecture (I-M).

9b. Drafting and maintenance of an up to date mailing list for recipients of relevant information, bibliography, unpublished studies and other material, by Region and perhaps Prefecture (I-M).

9c. Notification to all interested services and other parties about the existence of archives (I-M).

10. Second approach to the Greek wetlands inventory (M).

### **3.8. Specific objective 8: Information, environmental education and awareness about wetlands**

Necessity and expected benefits: Increased information, education and awareness campaigns for the public and specific social groups (IEPA) as regards the values of wetlands and the dangers that threaten them is considered as a necessary element for their protecting. Public support and understanding of wetland values by decision-makers is a necessary prerequisite for mobilising policy making and legislative activity related to the protection of wetlands. It is also necessary for ensuring financial resources, the effective application of legislation on wetlands and their sustainable management. Moreover, more than 150 non-profit environmental NGOs in our country, with very different structures and operation, are working for the protection of Greek nature. These organisations have contributed, especially during the past 10 years, to the protection of natural ecosystems. With suitable support, their role in IEPA can be reinforced. Investment in IEPA actions for small children and young people is perhaps long-term but it is certainly the most promising option for the future, because the human mind and soul are more sensitive and receptive at these ages. The production of relevant material for the following actions is self-evident.

#### Required actions:

1. Study of the requirements in the area of information, education and awareness (IEPA) on wetland issues, determination of the objectives of IEPA activities (programmes) and determination of target groups at all levels. Evaluation should be foreseen at the programme planning stage (I-M).

2. Recording and evaluation of information and public awareness activities (and related material) regarding wetlands that have been carried out until now in order to select or apply successful approaches and exploit existing material after it has been adapted to special conditions (I).
3. Creation of standard educational material for wetlands, to be adapted according to the various target groups (I).
4. Organisation of public information and awareness campaigns for certain social groups and managers (of identified target groups) at a local, regional level, in accordance with the method that was developed during the 1<sup>st</sup> phase of the MedWet initiative for Mediterranean wetlands or through other successful approaches (I-M).
5. Organisation of IEPA programmes about wetlands for the personnel of the Ministry for Education, the Ministry for Environment and the Ministry for Agriculture that is responsible for the evaluation and approval of IEPA project proposals (I).
6. Organisation of IEPA programmes about wetlands for the primary and secondary education teaching community: directors, teachers and professors, pupils and school advisors (I-M).
7. Support of Environmental Education Centres in the design and implementation of IEPA programmes for the wetlands for which they are responsible, and other information Centres that have been set up in various places, through community or other programmes (M).
8. Support of the efforts made by active environmental NGOs in the field of IEPA and training of members in the organisation of related activities (M).
9. Support institutions that deal with wetland matters so that they may offer as much as possible to the protection of wetlands, including IEPA activities or scientific and technical support for related activities that are being carried out by other bodies (I-M)
10. Organisation of meetings and workshops, within the framework of organised campaigns for important wetlands, for the promotion and discussion on positive elements, values, actions, etc or problems (M).
11. Promotion of co-operation between Local Government bodies, Regions, environmental NGOs, development bodies, educational establishments, for carrying out IEPA programmes on wetlands (M).

12. Development of co-operation between the above bodies and museums, zoos and botanical gardens, aquaria, animal care centres in order to organise exhibitions and programmes that contribute to IEPA on wetlands and their biodiversity (M).

13. Organisation of international IEPA programmes for trans-frontier wetlands (I-M).

### **3.9 Specific objective 9: International co-operation in topics of wetland resources management**

Necessity and expected benefits: The international convention on wetlands (Ramsar Convention) may be broadly considered as international co-operation on wetland management and protection issues. The same applies to conventions that include wetland protection in their objectives (Convention on Biological Diversity, Barcelona Convention, Bern Convention, Bonn Convention), related EU Directives (79/409/EC and 92/43/EC), trans-frontier initiatives developed within the framework of relevant financial instruments (e.g. INTEREG), and co-operation among various countries within the framework of European Union programmes (e.g. MedWet), international organisations or other bodies that deal with issues of wise management and protection of wetlands or other natural areas. Countries that have signed the Conventions or that are obliged to comply with Community Directives are in fact working within a common framework for the fulfilment of the same objectives whereas certain international conventions develop protocols of co-operation (e.g. Ramsar Convention or Convention on Biological Diversity). For Greece, international and supra-national co-operation on wetland management and protection issues is of paramount importance because, on the one hand, our country can benefit substantially from the exchange of knowledge and experience with other countries on the said subjects, and on the other hand, it hosts quite a few trans-frontier rivers and part of lakes Megali Prespa, Mikri Prespa and Doirani. Moreover, given the important number of migratory species of avifauna that spend a certain part of their life in our country, international co-operation such as the aforementioned conventions is likely to play a primary role in their protection.

#### Required actions:

1. Establishment of a national committee for wetlands (within the framework of the broader committee for ecologically important areas of Greece) and determination of its function and actions, including co-operation with other international conventions or Community Directives (I).

2. Planning and co-ordinated implementation of activities for the fulfilment of the Ramsar Convention and the 1997-2002 Ramsar Strategic Plan objectives, in co-operation with other contracting parties to the Convention (I).
3. Consultation with neighbouring countries in order to co-operate for the rational management of water resources and trans-frontier wetlands (e.g. through the ratification of official bi-lateral or multi-lateral agreements on protection measures (I).
4. Co-operation of EKBY and other organisations and institutions with international organisations that have similar orientations (Wetlands International, WWF, IUCN, Birdlife International) and other similar institutions of other countries, at a scientific level, in order to tackle management problems through the utilisation of their experience (I-M).
5. Development of co-operation among Greek institutions, wetland management/conservation centres particularly in the Mediterranean, for a single and co-ordinated confrontation of similar management problems in this geographical area (I-M).
6. Participation of Greece in EU or international programmes (e.g. IUCN), which include exchanges of experience or wetland protection actions (M).
7. Organisation of international IEPA programmes for trans-frontier wetlands (I-M).

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#### **4. POSITIVE STEPS TOWARDS SUSTAINABLE MANAGEMENT AND PROTECTION OF WETLANDS**

Many of the suggested actions are already under various stages of implementation. This is very promising, as the implementation of this strategy will not have to start from zero.

##### **4.1. Formulation and adoption of national policies related to wetlands**

In chapter 1.3.1. the main points of national policies related to wetlands were described. This description shows that efforts have started to integrate the sustainable use of natural resources and in particular water and wetlands in the development rationale.

Concerning international co-operation for the protection of the country's trans-frontier wetland resources is, it is expected that the Environmental Protection Directorate set up recently by the Ministry for Foreign Affairs shall provide an

impetus. This new service deals exclusively with the protection of natural resources by promoting actions that contribute to handling trans-frontier environmental problems. The Directorate has established a channel of communication with national NGOs, and has invited them to participate in an informal advisory forum.

#### **4.2. Projects and actions to promote the protection of Greek wetlands**

Specific actions in favour of the protection of wetlands that have begun during the current decade and are still running, are described below. This chapter is largely based on bibliographic reference 14.

##### **4.2.1. Delineation, submission of maps and temporary legal protection of wetlands of international importance**

Final maps for all Greek wetlands of international importance have been sent to the Ramsar Secretariat. Moreover, for all wetlands except L. Volvi and Koronia and L. Mikri Prespa, Joint Ministerial Decisions (JMDs) have been signed between 1990 and until the end of 1998. Of course, L. Mikri Prespa, and the Evros Delta have been protected by Presidential Decree (PD) for a long time. JMDs set precise boundaries for the protected item in each area, determine zones corresponding to the various degrees of protection and describe permitted or prohibited activities, and the terms for practising permitted activities. JMD have a three-year duration. Within the framework of the "programme for confronting special environmental problems and system for operating and managing protected areas" that is being carried out by the 2<sup>nd</sup> CSF since 1996, Specific Management Studies (SMSs) have been drafted for the Ramsar areas that will result in draft PDs. Currently, draft PDs are ready for certain areas and draft PDs for the other areas are at the final stage. These draft PDs are to be forwarded to local communities and information campaigns will be organised at the same time so that they may be accepted more easily.

##### **4.2.2. Wise use**

###### **4.2.2.1. Management plans – Specific Management Studies**

As mentioned above, JMDs for Ramsar areas determine broad management orientations. Moreover, SMS whose structure is very similar to a management plan go as far as formulating the orientations of the management plan for each area. In other words, they describe and explain the necessity of specific projects, arrangements and, in general, any type of intervention (e.g. technical, economic,



institutional etc). Specific operation and management regulations for protected areas (management orientations) will be integrated in the PDs that are being prepared. Thus, a management programme will be available upon issuance of the PDs. For highly mature management issues, the programme may be more specific and detailed. For issues that require further examination, the management programme shall foresee studies and other steps to be taken for specifying the relevant management measures. The Ministry for the Environment, Physical Planning and Public Works shall co-ordinate the drafting of detailed management plans.

Certain projects that have been carried out within the framework of the "programme for confronting special environmental problems and system for operating and managing protected areas", and that have been considered by local services and the central competent service of the Ministry of Environment as priorities, have started to be implemented under Programme Agreements (PA) that have been signed for all wetlands of international importance.

Within the framework of the 2<sup>nd</sup> CSF (Operational Programme: Environment or EPPER), SMSs for the other important wetland areas are at various stages. Examples are the ones for Lake Plastira, river Aherondas, river Kalamas and the Kalodikos swamp, Trizinia wetland, the coastal wetland of Vravra-Schinias, the Moustos lagoon and the wetlands on the islands of Kefalonia, Limnos, Lesvos and Kos. Moreover, SMSs for the NATURA 2000 Network that include some wetland habitats, e.g. Lake Kaiafa and the broader coastal zone of the bay of Kiparissia and finally rehabilitation studies for lake Mavrouda.

#### 4.2.2.2. Management bodies

As soon as the Ministry for the Environment, Physical Planning and Public Works finalises the precise structure and operation of the management bodies for protected areas, based on the existing institutional framework, the relevant bodies will be established for areas of Greece that are important from an ecological point of view, including wetlands. These bodies, as far as wetlands of international importance are concerned, will be given a legal status through the expected PDs. Given the existence of an infrastructure (see 4.2.2.3.) and until Management Bodies have been established, Preliminary Management Schemes (PMS) have been set up in wetlands of international importance in the form of Joint Committees, through the Programme Agreements signed by the Ministers for the Environment and Agriculture, the Regions and Local Services. Joint Committees receive administrative and secretarial support from the corresponding Development Agencies.

Environmental organisations are invited to participate in these schemes according to their specialisation. These schemes are preparing the ground for future local management bodies. Their objective is a. to deal immediately with matters that concern everyday management problems of the areas and b. to supervise the execution of projects related to infrastructure, monitoring and management. Moreover, they informally act as co-ordinators of various activities that are managed by the respective services. Specialised scientific personnel have staffed PMSs. The European Union (2<sup>nd</sup> CSF) covers the cost of operation of the initial phase. Upon commencement of the Programme Agreements (PA), PMSs monitor the implementation of PA projects, discuss the proposals of the Advisory Committee or other urgent matters concerning the management of wetlands. The Advisory Committee is constituted of representatives of user groups and meets twice or three times a year.

The problem of guarding wetlands of international importance remains a serious one due to an insufficient number of guards and necessary equipment. However, PMSs in all areas have hired "guards-eco-guides" since 1997. These guards are not responsible for arresting violators but their presence seems to act against illegal actions both in an anticipatory (through persuasion) and in a repressive way (through denunciation to state authorities). Awareness of the local population contributes to this. In many areas, this awareness has increased during the last years.

#### 4.2.2.3. Information, monitoring and guarding infrastructure in important wetlands

Since 1922, Information Centres, guardhouses and watchtowers have been constructed and equipped (office equipment and equipment for environmental interpretation) with the help of various types of funding, in all wetlands of international importance. For each area, allowance has been made in the corresponding PA for the improvement of infrastructure and in particular equipment so that these units may become fully operational as centres for information activities, guided tours, eco-tourism etc. Construction problems (imperfections, damage) are also dealt with through PAs.

The construction of new Information Centres or the completion of existing ones and the implementation of other environmental interpretation projects are under way for the other important wetland areas mentioned in 4.2.2.1., mainly within the framework of the EPPER.

#### 4.2.2.4. Protection actions through the implementation of Programme Agreements

These Agreements include a number of projects and activities and each wetland of international importance has a special timetable and budget. Projects that have been included in the PAs are being financed by the 2<sup>nd</sup> CSF mainly and other financial instruments. They are to be completed within the 1996-1999 four-year period. The various projects have reached various stages of execution.

The objects of the PA for each area are:

- a. To promote procedures to establish the Protection and Promotion Association. Phase A' (4 months' duration), foresaw for each of the areas, the establishment of a Protection and Promotion Association by the responsible local authorities. Upon its establishment, the association became the successor of local authorities and stands in for them as far as the rights and obligations that ensue from the PA are concerned. The Protection and Promotion Association is obliged to facilitate all contracting partners in fulfilling their obligations, to take all necessary actions for supplying extra equipment for the functioning of the infrastructure, to receive the existing infrastructure and equipment and to use it for the fulfilment of the objectives of the PA or to concede the equipment to another contracting partner, and finally, to hand over the infrastructure and equipment to the Ministry for the Environment, Physical Planning and Public Works in good and operational condition.
- b. Organisation of a conference in order to support the Association and issuance of the necessary supportive material.
- c. Operation of the Information Centre as a point of reference and information on the functions-values of the area, as a mechanism for promoting information and awareness and as a mechanism for organising guided tours, eco-tourism and other special actions. In order to fulfil this objective, a series of actions, studies and projects are being carried out: i. support, co-operation, continuous information of competent bodies and identification of problems, ii. design and implementation of information and awareness projects for competent bodies and the public, iii. Design and implementation of projects to attract, receive, inform and guide visitors and special groups to the Information Centre and the protected area, iv. Organisation and operation of archives and a library, v. organisation of conferences, vi. publication of information material, production of video films and other audio-visual material for making presentations, and publication of a quarterly information bulletin, vii. Elaboration of special projects (study of projects to promote the areas, training of guards-guides and the personnel of the Information Centre, monitoring of environmental quality).
- d. Design of a programme for guarding the area by the responsible forest authority (and the Local Government of Thessaloniki for lakes Koronia and Volvi).

It is clear (see paragraph c above) that particular importance has been given to information and awareness actions in general. The role that Information Centres have started to play as focal points for information and the co-ordination of actions appears to be remarkable. Moreover, a clear increase in environmental education activities has been noticed in these wetlands.

PAs involve Local Government in wetland management and protection issues and therefore the local societies that Local Government represents.

Apart from the wetlands of international importance, PAs with a similar structure and functioning have been signed for other important wetlands (see 4.2.2.1), in order to facilitate the implementation and monitoring of the corresponding SMSs, other infrastructure and management projects, and information-awareness activities that are under implementation or are being planned for these areas.

#### **4.3. Removal of three wetlands of international importance from the Montreux Record of the Ramsar Convention**

The Montreux Record that is kept by the Ramsar Bureau contains wetlands of international importance that, according to the countries to which they belong, are threatened by changes in their ecological character and require immediate measures to protect them. At the 4<sup>th</sup> Conference of the Contracting Parties (COP4) in 1990, the Greek government, well aware of its responsibility, listed all 11 Greek wetlands of international importance (10 now, following the unification of two areas) on the said record and accepted the relevant recommendations of the 4<sup>th</sup> Conference and the 2 subsequent ones (in 1993 and 1996 respectively). The decisions and recommendations for all Greek Ramsar wetlands concerned matters relating to their precise delimitation and the submission of maps, legal protection, the drafting of management plans and the safeguard of their ecological character. In 1998, the Ministry of Environment, jointly with the Ramsar Bureau, appointed an independent committee of experts. The mandate of this committee was to examine the possibility of removing certain Greek Ramsar wetlands from the Montreux Record. The committee examined the progress that was made during the past years, based on the recommendations of the Convention, and noted the difficulties and problems that persist in the various areas. It proposed that the following wetlands be removed from the Montreux Record: Evros Delta, Lake Mikri Prespa and Artificial Lake Kerkini. The Ministry for the Environment, Physical Planning and Public Works accepted the proposal and submitted a relevant request to the Ramsar Secretariat. The removal of these three wetlands from the Montreux Record was officially announced at the

7<sup>th</sup> COP in Costa Rica (May 1999) and the associated Resolutions of the Conference were issued. The Conference praised the Greek State for the seriousness with which handled the Montreux Record as a tool for protecting its wetlands.

#### **4.4. Identification and description of types of habitats**

The interest in natural areas shown by the Ministry of Environment is proven by the implementation, within the framework of the 2<sup>nd</sup> CSF of a project entitled: "Identification and description of types of habitats in areas of interest for the conservation of nature". The implementation of this project commenced at the beginning of 1999, after an important preparatory phase. The project concerns all sites of the NATURA 2000 Network on the Scientific catalogue (264 sites). The project is expected to contribute to the sustainable management of important Greek wetlands in the near future because it will fill substantial gaps in knowledge and will provide a basis for management.

#### **4.5. Hydrological and meteorological data base**

The National Hydrological and Meteorological Data Bank is a data base containing an important number of documents containing hydrological, hydrogeological and meteorological data from all over the country. With the use of suitable software applications and Geographical Information Systems a synthesis of the information can be made and conclusions can be drawn concerning the evaluation, control and design of infrastructure and management projects. Some of the applications of the National Hydrological and Meteorological Data Bank are, e.g. sewerage network evaluation, measurement of reservoirs, design and construction of irrigation or drainage networks, forecast of wet and dry periods, evaluation of flooding danger, evaluation of water resources, qualitative and quantitative evaluation of underground aquifers etc. It is clear that information obtained from the above applications is valuable for the sustainable management of wetlands, and the rehabilitation-restoration of wetland functions. The project is being financed by the Cohesion Fund and national resources and is being carried out (phase A': 1998-2001) by the Department of Civil Engineers of the National Polytechnic of Athens under the supervision of the Ministry for the Environment, Physical Planning and Public Works.

### **5. DISSEMINATION, PROMOTION, IMPLEMENTATION AND EVALUATION OF THE IMPLEMENTATION PROGRESS OF THE STRATEGY**

#### **5.1. Bodies that will implement the actions of the strategy**

The Ministry for the Environment, Physical Planning and Public Works is responsible for promoting the strategy at a political level, as the State's main environmental protection instrument. For the implementation of the actions themselves, co-operation and work is necessary at all levels (central, regional and local) among many services. The main ones are those of the Ministry of Environment, the Ministry of Agriculture and the Ministry of Development, and other Ministries depending on the subject. For actions focused on wetlands of Macedonia or Thrace and Aegean island wetlands, the competent Ministries for Macedonia-Thrace and of the Aegean will also have to be involved. In certain cases of supra-national co-operation, e.g. management of trans-frontier wetlands, the Ministries for Development and the Ministry for Foreign Affairs, which are responsible for trans-frontier waters, will have to be involved (33).

For any issues related to the search for or the provision of scientific knowledge or know-how, of organisations or institutions that have information will have to be involved (Universities, research and application institutes, other specialised bodies). For anything related to public information and awareness on the need to protect wetlands, existing or planned Education Centres (Evros Delta, Vistonida, Nestos Delta, Kerkini, Koronia-Volvi, Axios-Loudias-Aliakmonas, Mavrouda, Prespa, Enipeas, Tavropos, Aspropotamos, Schninias, Mesolongi, Amvrakikos, Kalodiki-Kalamas, Kotihi, Psifta- Trizinia, Koutavos, Psalidi-Kos, Kalloni-Lesvos, Aliko-Limnos, Dimosari), the Environmental Information Centres of the Ministry for Education (Soufli, Elefterio-Kordelio in Thessaloniki, Kastoria, Konitsa, Mouzaki, Argroupolis-Athens, Klitoria and Akrata), and environmental NGOs will play a vital role. The contribution of national or local environmental NGOs to the identification of threats and the promotion and implementation of this strategy in general will be very important.

The consent and active participation of the organisations of social groups, e.g. fishing and agricultural co-operatives and chambers of commerce, is necessary for the implementation of numerous actions. The involvement of the private sector is important too.

Special care should be taken at various administrative levels, in accordance with legislation, to prevent degradation, apply measures foreseen by EIA studies correctly, monitor environmental parameters and apply approved management measures.

The Ministry of Environment together with the Ministry of Foreign Affairs and other Ministries that have joint responsibility will have to put forward relevant organisational structures with due consideration to the requirements of Community

Directives such as 92/43. Moreover, relevant instructions and circulars, as mentioned e.g. in the draft law on physical planning, should be prepared for the various administrative levels of the country.

The monitoring of threats during the policy planning and decision-making phase, should be organised at the level of Prefecture or administrative region, by the services that are responsible for the protection of nature. Anyone else would encounter difficulties in gaining access to the appropriate information and communicating with other services, and the result would be low efficiency.

Guards (guards-guides) who are employed already in protected wetlands, Forestry Service personnel after suitable training, environmental organisations and informed visitors, may participate in monitoring threats and in identifying changes in the field.

Undoubtedly, it should become common consciousness that this strategy, just like any other environmental protection strategy, may prove fruitful, only provided the majority of Greek citizens embrace it as a real collective necessity, and as a personal responsibility as well.

## **5.2. Dissemination and promotion of the strategy**

This strategy is the expression of political will, on the part of the Ministry of Environment, to intensify, to organise in a more systematic way and to increase the number of actions that aim at the sustainable development of wetlands situated on Greek territory, with priority to the most important ones from an ecological, social and economic point of view. Therefore, initiative for diffusion on the one hand and the implementation of described actions on the other hand will be entrusted to the said Ministry. In order to promote the implementation of actions, it is proposed that a special committee be set up (hereinafter the "wetlands committee"). This committee may form part of the larger NATURA 2000 Committee, which is to be set up in accordance with JMD 33318/3028 dated 28.12.98 (GG 1289B) on the "determination of measures and procedures for the conservation of natural habitats and wild fauna and flora". Its exact composition, content and responsibilities, the schedule of activities and financing possibilities to be examined, are a matter of political choice that should be dealt with immediately. Obviously, the wetlands committee will co-operate closely with local management bodies and with permanent or temporary scientific consultants.

The wetlands committee will also be able to help co-responsible Ministries (Ministry for Development, Agriculture) to proceed with the elaboration of their own plans of action for wetland resources.

Finally, this wetlands committee will undertake on a continuous basis, to identify suitable financial instruments that are necessary for the implementation of the actions of this strategy, in accordance with the priorities that it will set.

A prerequisite for a smooth progress of implementation of this strategy is its widest possible diffusion, firstly to all decision-making services and bodies, secondly to those that are in a position to implement the various decisions, and finally to the general public that should understand their necessity and support the decisions.

The diffusion and integration of the strategy in sector policies, i.e. in planning and decision-making on land-use issues, physical planning, water resource management, forestry and coastal zone management, tourist development and other environmental and natural resources management measures (at a national, regional and local level) constitute a priority. Moreover, special attention should be given to the integration of the principles of sustainable wetland management in Environmental Impact Assessment and the imposition of environmental terms on projects that affect wetland ecosystems. For these purposes, existing horizontal and vertical mechanisms for promoting necessary management orientations and measures (NATURA 2000 Network, Special Protection Areas based on 79/409/EC, JMDs and PDs for the delimitation and management of Ramsar wetlands, planned management bodies for protected wetlands) to Public Administration should be reinforced and improved. The aforementioned wetlands committee can play a vital role in this.

### **5.3. Evaluation of the progress of implementation of the national strategy for wetland resources**

The progress of implementation of the strategy should be examined systematically, at predetermined intervals (e.g. at the end of each year), based on the report about the various actions. Moreover, the wetlands committee may draft a report on the implementation of strategy actions, within the framework perhaps of the general report that the NATURA 2000 Committee is obliged to draft. This report should be drafted for the first time by the year 2000 and subsequently, every six years, as foreseen by article 17 of JMD 33318/3028. When the wetlands committee begins to function, it should determine the mechanism through which it will collect all information that is necessary for evaluating the progress of implementation and



report on any obstacles. The conclusions of evaluation and ensuing orientations shall be forwarded to involved and interested services, institutes, organisations and other bodies. Periodic evaluation of the degree of implementation of the strategy will constitute a feedback mechanism and its objective will be to improve the planning of actions and increase the effectiveness of actions under implementation.

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## **ANNEX 1: LEGAL FRAMEWORK FOR THE PROTECTION OF WETLANDS**

In the following review of legislation, international conventions ratified by Greek legislation are presented in the last group and conventions that our country has signed but has not ratified by a corresponding Greek law, are presented in the sub-chapter "international conventions". The most important legal documents are the following (17).

### **1. Greek Legislation**

#### **1.1. Protection of species**

- P.D. 67/1981 on the protection of endemic flora and wild fauna and the determination of a procedure for co-ordinating and controlling research on them
- L. 1650/1986 on the protection of the environment (articles 20, 22)
- L. 2055/1992 ratification of the treaty on international trade in endangered species of fauna and flora, together with annexes I and II (CITES)
- J.M.D. 414985/1985 management measures for wild avifauna (arrangements related to Directive 79/409/EC)

#### **1.2. Protection of species and habitats**

- L. 1469/1950 historical sites and sites of outstanding natural beauty
- L. 996/1971 national parks, aesthetic forests and protected natural monuments
- L. 191/1974 ratification of an international agreement (Ramsar, Iran 2.2.1971) on the protection of wetlands of international importance (Ramsar Convention)
- L. 177/1975 hunting reserves
- L. 1335/1983 ratification of an international convention (Bern, 19.9.79) on the conservation of wild life and the natural environment of Europe (Bern Convention)
- L. 855/1978 ratification of an international convention (Barcelona, 16.2.76) on the protection of the Mediterranean sea from pollution and L. 1634/1986 ratification of protocols 3 on the protection of the Mediterranean from land-based sources of pollution and 4 on specially protected areas of the Barcelona convention)
- L. 1650/1986 on the protection of the environment (articles 19-21)
- L. 2204/1994 ratification of the convention on biological diversity (Rio de Janeiro, 5 June 1992) and Decision 93/626/EC of the Council

#### **1.3. Management of natural space and resources**

- L. 998/1979 on the protection of the country's forests and forest areas in general
- L. 1734/1987 grazing areas and regulation of matters that concern farming and other concessions, and matters that concern forest areas
- L. 1337/1983 extension of town plans and urban development
- JMD 69269/5387/1990 classification of projects and activities into categories, content of Environmental Impact Assessment studies (EIA)
- L. 1739/1987 management of water resources

## **2. Community acts**

- Directive 92/43/EC on the conservation of natural habitats and wild fauna and flora
- Directive 79/409/EC on the conservation of wild birds
- Regulation 2078/92 of the Council of the European Communities concerning agricultural production methods that are compatible with environmental protection and the conservation of nature
- Directive 91/676/EC on the protection of underground and surface water from nitric substances of agricultural origin
- Directive 91/271/EC on the treatment of urban effluents

## **3. International conventions (signed but not yet ratified)**

- Bonn convention on the conservation of migratory species of wild animals (valid since November 1983)
- Convention on the protection of international cultural and natural heritage (valid since December 1975)

## **ANNEX 2: REFERENCES TO STRATEGIC ORIENTATIONS AND PREVIOUS EFFORTS TO FORMULATE A STRATEGY FOR WETLANDS OR THE NATURAL ENVIRONMENT OF GREECE**

### ***Action Plan for the Protection and the Management of Greek Wetlands (12)***

Drafted in 1989 by a working group composed of 30 Greek and foreign experts under the supervision of Worldwide Fund for Nature (WWF), the Laboratory of Ecology and Environmental Protection of the Department of Geoponics of the University of Thessaloniki and the International Union for the Protection of the Environment (IUCN). The first organisation was the main financier. This plan was presented in its final form at four open meetings in 1989 - 1990 (Thessaloniki, Athens, Xanthi and Patras) at which hundreds of specialised scientists, high-ranking civil servants, members of environmental organisations etc. participated. This plan has drawn the attention of the Greek State but has never been approved officially.

### ***National Strategy for Greek Nature (20)***

This is a very remarkable joint effort that was co-ordinated by the Greek Society for the Protection of the Environment and Cultural Heritage. A large amount of valuable informative material on various environmental problems, including special

documents on wetlands was produced that has not been used yet. The European Union financed the project.

#### ***Caring for the Earth (16)***

This is a 228-page book, published in 1991 that circulated throughout the world. It is the result of co-operation between the Worldwide Fund for Nature, the United Nations Environment Programme and the International Union for the Conservation of Nature.

It sets forth nine principles that should govern Man's attitude towards living organisms and a society that wishes to use resources in a sustainable way. Moreover, it outlines a framework for efforts to be made in order to implement these principles and recommends specific measures. This book may be considered as an international strategy for the use of natural resources and it places great emphasis on the need to change human behaviour and to distribute resources fairly.

#### ***Towards the wise use of wetlands (8)***

This is a comprehensive 180-page book published in 1993 by the Ramsar Convention Secretariat. It describes 17 international, national and local efforts to use resources in a rational way and summarises the lessons learnt from these efforts. Moreover it contains guidelines for wise use and instructions for applying the notion of rational use, which has been adopted by the contracting parties.

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#### **BIBLIOGRAPHY**

*The following sources are mentioned in the text of the strategy with their corresponding numbering.*

1. AMPHIBION (Number 18). October 1997. Directive 92/43 (Habitats Directive) 15 questions and answers.
2. Anagnostopoulou, Maria (editor). 1996. A guide to monitoring the "NATURA 2000" Network areas. Goulandris Natural History Museum – Greek Biotopes Centre. Themi. 163 p.
3. Bartzoudis, G. 1995. Land reclamation works in the plain of Serres. pp. 57-82: *In*: Skordas, K. and M. Anagnostopoulou (project co-ordinators). Sustainable

management of the water of Lake Kerkini. Minutes of a Training Programme, Serres, 25-29 September 1995. Greek Biotope/Wetland Centre (EKBY), Ministry for the Environment, Physical Planning and Public Works, Ministry for Macedonia – Thrace (MedWet publication).

4. Communication from the Commission to the Council and the European Parliament: "Wise use and conservation of wetlands" (Brussels, 29/5/95)

5. Convention on Biological Diversity. 1992. Rio de Janeiro, Brazil.

6. Convention on Wetlands of International Importance especially as Waterfowl Habitat. 1996. Strategic plan 1997-2002. Proceedings of the 6th meeting of the Conference of the Contracting Parties. Brisbane, Australia, 19-27 March 1996.

7. Council of Europe, UNEP, European Centre for Nature Conservation. 1996. The Pan-European Biological and Landscape Diversity Strategy. 50 p.

8. Davis, T.J. (ed.). 1993. Towards the wise use of wetlands. Wise Use project. Ramsar Convention Bureau. Gland, Switzerland.

9. European Community. 1993. "Towards sustainability": 5<sup>th</sup> Action Plan of the European Community.

10. Finlayson, C.M. (compiler). 1994. Conclusion of working group 4: Ecological change - concept and application: Defining gaps and priorities. p. 157-161: *In*: G. Aubrect, G. Dick and C. Prentice (editors). Monitoring of ecological change in wetlands of Middle Europe. Proceedings of an international workshop held in Linz, Austria, 26-30 October 1993. Stapfia 31 and IWRB Special Publication 30.

11. Gerakis, P. A. 1996. Proposal for the formulation of a National Strategy for Wetland Resources 2<sup>nd</sup> Draft Working Document.

12. Gerakis, P.A. (editor). 1990. Protection and management of Greek biotopes. Proceedings of a working meeting in Thessaloniki, 16-21 April 1989. WWF, Lab. Ecol. Geop. Unit, Un. Of Thes. and IUCN. Thessaloniki.

13. Gerakis, P.A. and E. Koutrakis (editors). 1996. Greek Wetlands. Goulandris Natural History Museum – Greek Biotope/Wetland Centre. Commercial Bank of Greece. Athens. 382 p.

14. Gerakis, P.A., Maria Anagnostopoulou, K. Georgiou and M. Scoullou. 1999. Expression of opinion with regard to conservation actions for Greek Ramsar wetlands and to the applicability for removal from the Montreux Record. Report to the Ministry for the Environment, Physical Planning and Public Works and the Ramsar Bureau. 113 p.
15. Hellenic Ornithological Society. 1994. Important areas for the birds of Greece, acquaintance with the important biotopes of Greece. Special publication. 272 p.
16. IUCN/UNEP/WWF. 1991. Caring for the Earth. A strategy for a sustainable living. Gland, Switzerland. 228 p.
17. Lazaretou, Th. 1994. Guide on the lawful protection of nature. Greek Biotope/Wetland Centre (EKBY). 48 p.
18. Ministry for Development, Water Potential and Natural Resources Directorate – Athens Polytechnic School –Institute for Geological and Metallurgical Studies- Planning Centre (KEPE) 1996. Draft management programme for the wetland resources of the country. Athens.
19. OECD. 1997. Framework for case studies on experience with the implementation of incentive measures to promote the conservation and the sustainable use of biodiversity. Environment Directorate, Environment Policy Committee, Group on Economic and Environment Policy Integration Expert Group on Economic Aspects of Biodiversity. 23 p. (ENV/EPOC/GEEI/BIO(97)2/REV1)
20. Scoullou, M. I. (programme co-ordinator). 1993. National Strategy for Greek Nature. Unpublished report.
21. Spyropoulou, S. and D. Dimopoulos. 1998. Incentives for the conservation of the nesting grounds of the Sea Turtle *Caretta caretta* in Laganas Bay, Zakynthos, Greece. Case study presented in the OECD Expert Group on Economic Aspects of Biodiversity.
22. The Venice Declaration on Mediterranean Wetlands and the Mediterranean Wetlands Strategy. Unpublished report. Venice, June 1996.
23. Tsiouris, S.E. and P.A. Gerakis. 1991. Wetlands of Greece: values, alterations, conservation. WWF, Laboratory of Ecology and Environmental Protection of Faculty of Agriculture of Aristotle University of Thessaloniki, IUCN. Thessaloniki, 96 p.

24. Valaoras, G. (compiler). 1997. Mediterranean Conservation Strategy/Action Plan 1996-2002. WWF Mediterranean Programme Office. Roma. 28+24 p.

25. Zalidis, G. 1996. Creation, rehabilitation and restoration of wetland functions as a means for sustainable management of the natural resources of a hydrological basin. Greek Biotope/Wetland Centre (EKBY). 18 p.

26. Zalidis, Ch. G. and ? L. Mantzavelas (editors). 1994. Inventory of Greek wetlands as natural resources (First approach). Greek Biotope/Wetland Centre (EKBY). xviii + 587 p.

27. Zalidis, Ch. G., X.P. Dimitriadis, and S. L. Chatzigiannakis (editors). 1995. Ideotype of the former Lake Karla as an evaluation baseline of the proposed solutions for the construction of the reservoir. Greek Biotope/Wetland Centre (EKBY). Thessaloniki. 91 p.

28. Zalidis, G.C., A.L. Mantzavelas and Eleni Gourvelou. 1997. Environmental impacts on Greek wetlands. Wetlands 17:339-345.

#### **Legislation**

29. Directive 79/409/EC on the conservation of wild birds.

30. Directive 92/43/EC on the conservation of natural habitats and of wild fauna and flora.

31. Regulation 2078/92/EC on on agricultural production methods compatible with the requirements of the protection of the environment and the maintenance of the countryside

32. L. 1650/86 (GG 160 ?/18-10-86). On the protection of the environment.

33. L. 1739/87 (GG 201 ?/20-11-87). Management of water resources and other provisions

34. L. 2204/1994 (GG 59?/15-4-94). Ratification of the Convention on biological Diversity.