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Note by the Executive Director

The attached document, which was prepared by E. Carp for the International Union for Conservation of Nature and Natural Resources, is submitted to those participating in the Consultation for their information.

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INTERNATIONAL UNION FOR CONSERVATION OF NATURE AND NATURAL RESOURCES

Preliminary Review of the Wetlands of International Importance in the Mediterranean Region

by

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Studying the atlas of the Mediterranean countries one becomes rapidly aware of the fact that there are far less wetlands in this region than in the temperate zones of Europe and Asia. This becomes even more evident if one examines the maps which have been produced to demonstrate the results of the annual mid-winter waterfowl counts (1967-1973) which were organized by the Populations Division of the International Waterfowl Research Bureau (IWRB) with headquarters at Slimbridge (Glos.), England. Its co-ordinator, Mr. G.L. Atkinson-Willes in his outstanding study on the numerical distribution of ducks, swans and coots as a guide in assessing the importance of wetlands, (presented at the International Conference on the Conservation of Wetlands and Waterfowl, Heiligenhafen, Federal Republic of Germany, December 1974), illustrates that the number of suitable wintering sites for waterfowl is only a fraction of those in north-west Europe while the bodies of water are far more dispersed. (Figure 1, Count Points).

The character of the wetlands of the Mediterranean is usually quite different from those in the temperate zones. Many of them depend largely on the amount of rainfall in winter. Under the intense heat in summer many become strongly reduced by evaporation, some dry out completely and the life associated with them is to a large extent cyclical.

If one studies the maps of the wintering areas of the different species of waterfowl in the above-mentioned publication of Atkinson-Willes, one finds that in the Mediterranean region these are often situated in wetlands on or near the coast and that concentrations of waterfowl are often very large. Although the wetlands in the Mediterranean are sometimes quite vast, one becomes aware of the fact how vulnerable they are, knowing that most human activities are centred here along the sea-shore. Urban developments are spreading fast, port and industrial complexes are expanding along bays and estuaries, tourist-resorts are appearing in many places, often causing irreparable damage to the formerly unspoiled character of the landscape and the ecosystems of the site. Lagoons and lakes are being drained, sometimes for marginal agricultural projects, uncontrolled use of pesticides in areas bordering wetlands cause mortality in wildlife, heavy hunting pressure near urban centres is another danger. In order to preserve what is left of the Mediterranean wetlands we have prepared this list of sites which are of vital importance as a habitat for breeding, wintering and migrating waterfowl, while other sites have also been included because of their limnological and hydrobiological importance, their value for research, education and recreation. It does not pretend to be complete but is made up from data that are available at this moment.

It is meant to serve as a basis for discussions and to enable identification of those sites which should get immediate and maximum attention in order to safeguard the survival of their international values.

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Definition of a Wetland

It is perhaps useful to state here once more what is understood by the term wetland. At present scientists and conservationists generally accept the definition given in Article 1 of the Convention on Wetlands of International Importance, especially as Waterfowl Habitat, (Ramsar Convention), which came into force on 21 December 1975. (At present the following countries have become a partner to this Convention: Australia, Bulgaria, Finland, Federal Republic of Germany, Greece, Iran, New Zealand, Norway, Pakistan, Republic of South Africa, Sweden, Switzerland, United Kingdom, (31 September 1976). Six other countries have signed the Convention but have not ratified: Belgium, Ireland, Italy, Netherlands, Portugal and USSR).

Article 1 of this Convention reads:

> "For the purpose of this 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 tide does not exceed six meters."

The wetlands under consideration in this document are in conformity with this definition.

Projects dealing with the conservation of wetlands of international importance

Several projects with the purpose of evaluating the importance of wetlands have been co-sponsored by the International Union for the Conservation of Nature and Natural Resources (IUCN). Here should be mentioned:

A. Project MAR

This project deals with the conservation and management of temperate marshes, bogs and other wetlands, and resulted from the International Conference on Wetlands (MAR Conference), Saintes-Maries-de-la-Mer, France, 1962, co-sponsored with the International Council for Bird Preservation (ICBP) and the International Waterfowl Research Bureau (IWRB). A list of European and North African Wetlands of International Importance was published in 1965. The MAR list is based mainly on the importance of wetlands as a breeding, migrating and wintering site for waterfowl populations.

B. Project AQUA

The project deals with the conservation of aquatic habitats and originated in 1959. It was co-sponsored with International Biological Programmes (IBP). Its aim is to list bodies of water, mainly rivers and lakes

selected on their limnological and hydrobiological qualities. A list of AQUA sites was published in 1969 followed by a second edition in 1971 which includes about 650 areas in 76 countries. A third revised and extended version could be published in the near future.

C. Project TELMA

This project is dealing with the conservation of peatlands. It was initiated in 1966 and co-sponsored with IBP. It is preparing the publication of a list of temperate peatlands.

D. IUCN Directory of Wetlands of International Importance

Realizing that the MAR list (1965) only eight years after its publication was becoming rapidly outdated by developments in most countries, IUCN is aiming for a new publication which will revise the information of the MAR list, at the same time widening its scope by listing wetlands in other parts of the world, including AQUA sites as well. Initially it was intended to publish the data as a loose-leaved publication dealing with wetlands in the entire world. However, in view of the considerable costs involved this concept has been abandoned now and preference has been given to a bound publication covering the Wetlands of International Importance in the Western Palearctic. The manuscript for this publication should be ready by the end of July 1977.

The Directory will include besides the national list and a map for each country, descriptions of a number of selected sites mentioning data on their geographical location, area, altitude, depth, legal status, a short sketch of their ecology, management practices, threats, research that has been carried out or in progress, literature references.

Criteria for the selection of wetlands of international importance suitable for application on a world-wide basis

Criteria for evaluating the importance of a site were developed for each of the above-mentioned projects. Sziji and Atkinson-Willes have developed and tested criteria based on IWRB waterfowl counts applicable mainly to Western Palearctic sites. However the need was felt to arrive at a set of criteria which would be suitable for application on a world-wide basis. During the International Conference on Wetlands and Waterfowl at Heiligenhafen, Federal Republic of Germany, December 1974, the Committee on Criteria for identifying Wetlands of International Importance, after studying the criteria of the various projects, developed a set of criteria which takes into consideration all factors which determine the international importance of a wetland. These criteria fall into four distinct groups:

1. Criteria pertaining to a wetland's importance to populations and species

A wetland should be considered internationally important if it:

a) regularly supports 1% (being at least 100 individuals) of the flyway or biogeographical population of one species of waterfowl,

b) regularly supports either 10,000 ducks, geese and swans; or 10,000 coots; or 20,000 waders,

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c) supports an appreciable number of an endangered species of plant or animal,

d) is of special value for maintaining genetic and ecological diversity because of the quality and peculiarities of its flora and fauna,

e) plays a major role in its region as the habitat of plants and of aquatic and other animals of scientific or economic importance.

2. Criteria concerned with the selection of representative or unique wetlands

A wetland should be considered internationally important if it:

a) is a representative example of a wetland community characteristic of its biogeographical region,

b) exemplifies a critical stage or extreme in biological or hydromorphological processes,

c) is an integral part of a peculiar physical feature.

3. Criteria concerned with the research, educational or recreational values of wetlands

A wetland should be considered internationally important if it:

a) is outstandingly important, well-situated and well-equipped for scientific research and for education,

b) is well-studied and documented over many years and with a continuing programme of research of high value, regularly published and contributed to by the scientific community,

c) offers especial opportunities for promoting public understanding and appreciation of wetlands, open to people from several countries.

4. Criteria concerned with the practicality of conservation and management

Notwithstanding its fitness to be considered as internationally important on one of the Criteria set out under 1, 2 and 3 above, a wetland should only be designated for inclusion in the List of the Ramsar Convention if it:

a) is physically and administratively capable of being effectively conserved and managed,

b) is free from the threat of a major impact of external pollution, hydrological interferences and land use or industrial practices,

c) a wetland of national value only may nevertheless be considered of international importance if it forms a complex with another adjacent wetland of similar value across an international border.

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The present list

In drawing up this Preliminary Review of Wetlands of International Importance in the Mediterranean Region, the classification system based on the main natural wetland complexes distinguished by Isakov and further adapted by Eber, was used as is being done for the IUCN Directory of Wetlands of International Importance. A copy of the classification system can be found at the end of this document (Annex I).

Sites were selected according to the Criteria developed at the International Conference on the Conservation of Wetlands and Waterfowl at Heiligenhafen, Federal Republic of Germany, December 1974.

A short description is added in most cases to underline the particular importance of a site, its present state of protection and developments which are or will form a threat in the near future.

A few sites in Spain and in Morocco on the shores of the Atlantic have been added to this list as it is felt that these are closely connected to the ecosystems of the Mediterranean, and belong in particular as wintering sites for waterfowl to the Mediterranean group of wetlands.

Question marks appear sometimes after criteria (especially after the one which deals with practicality of conservation and management). It means that insufficient information is available. It is hoped that during the Conference at Hammamet more data on this matter can be obtained.

Spain

The present list of internationally important wetlands includes:

Mediterranean coast

1. Ebro Delta:

Province Tarragona	± 64,000 Ha.
Wetland types	3, 5, 7, 9, 17, 25
Criteria Heiligenhafen Conference	1a, e, 2a, c, 4a

Important wintering area for ducks, especially Anas penelope, Anas clypeata and coots (Fulica atra). Nesting area for ducks, coots, herons, gulls, terns and waders. Important migration stage for aquatic birds. Most valuable parts: La Encanizada, La Tancada, Isla de Buda and Canal Vell.

Not protected: Endangered by drainage, urbanization projects, mining and oilwell exploration, oilwell exploitation offshore. Urgent protection measures needed.

2. Albufera de Valencia and Vedados de Sueca:

Province Valencia	± 4,000 Ha.
Wetland types	7, 25
Criteria Heiligenhafen Conference	1a, e, 2a, b, 3b, c, 4a

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Important wintering area for ducks especially Anas acuta, Anas clypeata, Netta rufina and breeding area for ducks (a.o. Netta rufina), coots, as well as herons, until approximately 1970.

Not protected: Urbanization and industrial developments in the vicinity. Serious pollution problems annihilated former wealth of waterfowl. On the request of the Municipality of Valencia IUCN is advising on anti-pollution measures. Protection measures might restore this formerly very important wetland.

3. Pantano de Elche, Salinas de Santa Pola and Torrevieja:

Provinces Alicante and Murcia	
Wetland type	7
Criteria Heiligenhafen Conference	1a, e, 3a, c

Important area for wintering ducks. In 1973 a small colony of flamingoes (Phoenicopterus ruber) bred in the Salinas de Santa Pola. Migration stage for waders.

Not protected:

Atlantic coast (sites in Mediterranean climatological zone only)

4. Marismas del Guadalquivir:

Provinces Huelva and Sevilla	+ 250,000 Ha.
Wetland types	7, 8, 9, 12, 17, 20, 23, 25
Criteria Heiligenhafen Conference	1a, c, d, e, 2a, b, c, 3a, b, c, 4a

Approximately 30,000 Ha. protected as the National Park Donana. The most important, largely intact ecological system in South West Europe. Very important wintering ground for anatidae, especially Anas crecca, Anas penelope, Anas clypeata, and Anser anser. Breeding grounds for several species of ducks, (including the rare species Anas angustirostris and Oxyura leucocephala), coots, herons, gulls, terns and waders. The rare Spanish form of the Imperial Eagle, Aquila heliaca adalbertii is a breeding bird. One of the few remaining areas where the Spanish lynx (Lynx pardellus) occurs.

The future of the National Park is highly endangered by the agricultural and touristic developments in the bordering areas. The planned road from Huelva to Cadiz via Sanlucar de Barrameda will cut off this unique unspoiled landscape from the shore of the Atlantic. The effects of spraying with strong doses of pesticides in the adjacent agricultural grounds and the repeated outbreaks of Botulism in the last three years have taken a heavy toll of the waterfowl population breeding in this area.

If this unique landscape and its flora and fauna are to survive, urgent measures should be taken for the development of a conservation plan, the creation of buffer zones, introduction of strict rules and control on the use of pesticides and stop all further developments in the area.

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5. The Bay of Cadiz:

Province of Cadiz	
Wetland type	3
Criteria Heiligenhafen Conference	1a

The site is internationally important because of its wintering Anas penelope population. The bay is in many places surrounded by urban and industrial developments.

Not protected: The possibilities for the creation of a reserve in this area should be studied.

Inland sites

6. Laguna de Fuentepiedra:

Provinces Sevilla and Malaga	ca. 1,000 Ha.
Wetland type	17
Criteria Heiligenhafen Conference	1a, e, 2a, b? 3c, 4a, b

The only regular breeding site of flamingo (Phoenicopteru ruber) in Spain. Internationally important wintering area for ducks (especially Anas clypeata) and coots (Fulica atra).

Not protected: Measures for legal protection should be studied.

7. Tablas de Daimiel:

Province Ciudad Real	ca. 1,000 Ha.
Wetland types	13, 17, 18, 20
Criteria Heiligenhafen Conference	1a, e, 2a, 3a, b, 4a

Partly protected but drainage is continuing in adjacent areas which probably will affect the nature reserve. Probably the most important breeding ground for Netta rufina in Western Europe. Breeding colonies of Ardeidae. Important wintering area for Anatidae and Fulica atra. The question of the creation of effective buffer-zones should be raised once more.

8. Laguna de Gallocanta:

Province Zaragoza / Teruel	ca. 1,500 Ha. during flooding in winter
Wetland type	17
Criteria Heiligenhafen Conference	1a, e, 2a, 4?

Internationally important as a wintering ground for ducks (especially Aythya ferina and Netta rufina) and coots (Fulica atra). In summer this area contains little or no water at all.

Not protected although a project for the creation of a reserve in this area exists. Information on the future of the conservation project is needed.

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9. Lagoons and reservoirs in the central part of the Douro Basin:

Province Zamora / Palencia	ca. 6,500 Ha.
Wetland types	16, 18
Criteria Heiligenhafen Conference	1a, e, 2a, 4b, ?

The area is internationally important as a wintering site for geese (especially Anser fabalis). Otis tarda, Pterocles alchata and Pterocles orientalis occur in the area.

Not protected although a project for the creation of a reserve has been proposed in 1963 by the Spanish Ornithological Society. Drainage plans exist and it seems advisable to relaunch projects for a reserve which should also include the roost of Anser fabalis at the Reservoir of Esla.

10. The complex of reservoirs of the Tajo and Guadiana rivers in Central Spain:

Provinces Caceres, Badajoz and Toledo	
Wetland type	16
Criteria Heiligenhafen Conference	1a, e, 2b, 4a, b ?

This complex of reservoirs is distributed over a wide area which was formerly dry. It includes the reservoirs of Borbollon, Gabriel y Galan, Rosarito, Valdecanas, Castrejon, Cijara, Garcia Sola, Orellana and Zujar. They became an important wintering area for ducks and coots as well as Cormorants (Phalacrocorax carbo). Several thousand cranes (Grus grus) winter in the area and roost often on the shores of the reservoirs. The Black Stork (Ciconia nigra) which still has a small breeding population in Central Spain uses the reservoirs as a feeding and roosting area.

Not protected: The creation of several reserves in this area should be envisaged.

France

Only a relatively narrow belt in the southern "departements" of France is situated in the Mediterranean climatologic zone. The wetlands of international importance are few in number but the vast area of the Camargue (Rhône Delta) belongs to the most important wetlands of the Mediterranean. Protection of this magnificent area started already in 1927 and resulted in the creation of a nature reserve of over 10,000 Ha. It is now within the National Park of the Camargue (approximately 80,000 Ha.) which became effective in 1973.

The Petite Camargue, West of the Petit Rhône, privately owned and as valid a wetland as the areas between the two branches of the Rhône is endangered by urbanization projects since the ownership changed. The interesting lagoons along the coast of the Languedoc area between Aigues Mortes and

Perpignan have suffered severely from urbanization projects, the creation of new tourist resorts and marinas, anti-mosquito campaigns, pollution and heavy hunting pressure. At present only the Etang de Mauguillo seems to reach internationally important numbers of waterfowl in winter, but several other lagoons in the Languedoc form an important feeding area as well for the flamingoes (Phoenicopterus ruber) breeding in the Camargue.

It would seem appropriate to investigate whether some parts of the Rhône outside the Camargue area, including some of its tributaries (Gardon, Sorgue, Ouvèze, Cèze, Aygues and Ardèche) should be included in the List of Wetlands of International Importance due to the fact that they harbour what is probably the most southern Beaver (Castor castor) population in Europe.

1. Camargue:

Département Bouches du Rhône	ca. 142,500 Ha.
Wetland types	5, 7, 9, 11, 12, 17, 23, 24, 25
Criteria Heiligenhafen Conference	1a, b, d, e, 2a, c, 3a, b, c, 4a, b ?

Partly protected: The National Park Camargue (80,000 Ha) will maintain a balance between the natural resources and human activities. The Nature Reserve (13,117 Ha.) within the National Park and managed by the Société Nationale de la Protection de la Nature (S.N.P.N.) will monitor and safeguard the outstanding ecosystems in the Reserve. Two other areas are as well protected. These are the Réserve Départementale des Imperiaux, 2,770 Ha. and the property Tour du Valat, approximately 2,000 Ha. belonging to the Tour du Valat Foundation for the Study and Conservation of Nature. Many publications have appeared during the years describing the ecosystems of the Camargue. We mention here only its international importance as a wintering site for Anatidae, especially Anas platyrhynchos, Anas crecca, Anas penelope, Anas clypeata, Anas fuligula, Anas ferina and coots (Fulica atra). Phoenicopterus ruber has here its most important breeding colony in Europe (up to 6,000 pairs in some years). Important breeding area of Ardeidae, Laridae and Limicolae. Important migration stage for waterfowl and other aquatic birds.

Several of the lagoons and areas with temporary water are of great hydrobiological interest and are mentioned as such in the AQUA List (Les Cérisières, Marais de St. Seren, Les Relongues de la Baisse-Salée, Etang du Fornelet, Etang du Vaccares etc.).

2. Etangs de Languedoc - Rousillon:

Départements Hérault, Aude, Pyrenées Orientales
Belt of lagoons between Aigues Mortes and Perpignan

Wetland types	5, 6, 7,
Criteria Heiligenhafen Conference	1a, e, 2a, 3a, b, c, 4 ?

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Etang de Mauguio of international importance to wintering coots (Fulica atra), and feeding area of flamingoes (Phoenicopterus ruber).

Etang de Thau important for fish-farming, ostrei- and mytiliculture. Several other lagoons of the Languedoc are used by feeding flamingoes during part of the year. (Etangs de Arnel, Prevost, Ingrel, Perols, Vic

Only a few protected sites at present: Area greatly endangered by urbanization, tourist resorts, campings, pollution. Heavy hunting pressure.

3. Etang de Biguglia:

Corsica ca. 1,500 Ha.

This formerly important wetland has been degraded by the clearing of the bordering vegetation and the development of tourist facilities. Its importance as a wintering site for waterfowl or a stagepost during the migration season should be investigated once more. Hunting pressure is heavy.

Italy

The following groups of wetlands are under consideration for inclusion in the Directory of Wetlands of International Importance.

1. Lagunes di Marano e Grado:

Provinces Udine, Gorisia ± 3,000 Ha.

This complex includes the Laguna di Marano, Laguna di Grado, Valli di Zignago, Foce del Tagliamento, Stagno di Cortelazzo.

Wetland types 5,6, 7
Criteria Heiligenhafen Conference 1e, 2a, 4 ?

The brackish or salt water lagoons are separated from the sea by dunes in several places. Large numbers of breeding and wintering waterfowl especially Anatidae and coots, particularly in severe winters. Productive area for fisheries. With the exception of a few limited refuges the area is not protected. Parts of the area cannot be altered without the permission of landscape authorities. Endangered by drainage, touristic developments, increasing pollution problems.

2. Laguna di Venezia:

Province Venezia, 58,600 Ha. including the Laguna di Levante and Laguna di Ponente.

Wetland types 5, 6, 7
Criteria Heiligenhafen Conference 1e, 2a, c, 3a, b, c, 4a ?

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Vast complex of shallow basins, intersected by long, deep canals. Water from the Adriatic flows through the lagoons in tidal movements of great variation and intensity. Mudflats uncovered at low tide, and is of botanical interest. Its rich avifauna and importance as a wintering site for Anatidae, Rallidae and Limicolae, especially in hard winters, is endangered by the developments in the bordering areas; (agriculture, industrial developments, pollution, tourist resorts and hunting pressure). The establishment of a number of strict reserves after a study of the entire area would seem advisable.

3. Delta del Po:

Including Valli da Pesca di Rovigo, Laguna della Foce dell'Adige to Foce del Po di Goro.

Wetland types	6, 7, 9, 24
Criteria Heiligenhafen Conference	1e, 2a, 3a, 4 ?

Of commercial interest for fish farming. Important wintering area for Anatidae and Limicolae especially during severe weather conditions. Moderate to heavy hunting pressure. Plans for a regional park along the coast are in study.

4. Valli di Comacchio:

Provinces Ferrara and Ravenna, including Valle del Mezzano, Valle Bertuzzi, Sacca di Goro, Punto Alberete, Valle Campotto e Valle Santa, Vene di Bellocchio.

Wetland types	7, 8, 12, 15, 18, 21
Criteria Heiligenhafen Conference	1e, 2a, 3a, b, c, 4b ?

Remains of a former large complex of lagoons and marshes which have been drained. Fish farming has been introduced. Rich avifauna in the valli. Breeding birds include Anas platyrhynchos and Anas querquedula, Himantopus himantopus, Recurvirostra avosetta. Important numbers of wintering Anatidae, mainly Aythya ferina, Anas penelope, Anas platyrhynchos, Anas crecca. Punte Alberete is a bird sanctuary managed by the World Wildlife Fund. An observation tower open to the public has been constructed to permit a view into the colony of Ardeidae in the marshy wood.

The area is a landscape reserve, but there are only a few limited areas where wildlife is protected. (Orsi-Mangelli Private Reserve). A conservation plan for the entire area would be advisable.

5. Lagune di Lesina e Varano:

Province Foggia	± 11,000 Ha.
Wetland type	7
Criteria Heiligenhafen Conference	1e, 2a

Of botanical importance as well as to migrating and wintering Anatidae, Fulica atra and Limicolae.

Not protected.

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6. Stagni della Capitanata, Gulf of Manfredonia:

Provincia Foggia 700 Ha.
(Vasche del Cervaro, Vasche del Candelaro, Alma Donnata, Carapelle, Saline di Margherita di Savoia)

Wetland types 2, 7
Criteria Heiligenhafen Conference 1a, c, 2a, 4 ?

The fresh water lagoons are of international importance as a wintering site for Anatidae, especially Anas penelope, Anas acuta and Fulica atra. The formerly important wintering population of Anser albifrons has seriously declined after accidental poisoning by pesticides in the late 1960s and is down to approximately 30 birds. Hunting is controlled. The salines of Margherita di Savoia nearby are of interest as a migrating site for waders.

7. Laghi Pontini:

Province Latina
Lago di Fondi, Lago di Paola (o Sabaudia), Lago di Monaci, Lago di Caprolace, Lago di Fogliano)

The international importance of this complex of lakes will be checked as not enough information is available at this time.

8. Maremma meridionale:

Province Pisa
Lago di Burano, Laguna di Orbetello, Stagni della Trappola, Stagni della Diaccia.

Wetland type 7
Criteria Heiligenhafen Conference 1a, c, 2a, 3c, 4a, b

Of international importance as a relict of the Maremma landscape (Stagni della Trappola), and as a wintering and migration site for waterfowl, (Burano, Orbetello). WWF reserves have been established at Burano and a small part of the Orbetello Lagoon. It is hoped that the Maremma landscape of Trappola can be included in the project for a regional national park.

9. Maremma settentrionale:

Province Pisa
Stagni di Bolgheri, Lago di Massaciuccoli, Stagni di S. Rossore

The international importance of this complex of lakes will be checked as not enough information is available at this time. Bolgheri is an excellent example of a small, well managed waterfowl reserve of high educational value.

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10. Stagni di Cagliari, Sardinia:

Stagno di Molentargius, Saline di Macchiareddu

Wetland type	7
Criteria Heiligenhafen Conference	1a, 2a, 3c, 4a

Of international importance as a feeding area for waterfowl in winter and during migration, especially Phoenicopterus ruber. This species has attempted to breed at Molentargius in 1975. No hunting at Molentargius which is almost in the outskirts of the town.

11. Stagni di Orestano, Sardinia:

Stagno di Corru d'Ittiri, Stagno di S'Ena Arrubia
Stagno di Santa Giusta, Stagno di Cabras, Stagno di Mistras,
Stagno di Palmas Arborea, Stagno di Putzu Idu, Stagno di
Sale 'e Porcus

Wetland type	7
Criteria Heiligenhafen Conference	1c, e, 2a, 3c, 4a, b

Of international importance as a breeding, wintering and migration site for waterfowl. The lagoons are a breeding site for Porphyrio porphyrio and perhaps Oxyura leucocephala. Little or no protection.

A conservation plan for the wetlands of Sardinia is highly desirable. The Stagno di Molentargius has a high potential for the establishment of a wetland reserve with education facilities.

Two complexes of lagoons on Sicilia should be further investigated on their international importance. These are:

12. Stagni del Pachinese:

Including Stagno di Vendicari, Pantano Cuba,
Riviere di Gela, and a few other lagoons.

13. Stagnone di Marsala:

Stagnone di Marsala, Salina di Marsala, Salina di Trapani.

The following wetlands should be considered for inclusion because of their limnological or hydrobiological interest:

Lago di Monterose (Lazio, Latina)
Lago di Mergozzo (Piedmont, Novara)
Lago di Montarfano (Como)
Lago di Tovel (Trento, Alto Adige)
Lago di Bolsena (Viterbo, Regione Lazio)
Fonti del Clitunno (Umbria, Perugia)
Lago Trasimeno (Umbria)
Grotta Zinzulusa (Puglia)
Lago di Doberdo (Gorizia)
Lago di Lugano (Ceresio)
Lago Maggiore (Verbano)
Lago di Faro (Sicilia)
Lago di Ganzirri (Sicilia)
Fiume Anapo (Siracusa, Sicilia)
Bagno dell'Acqua (Pantellaria)

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Yugoslavia (Mediterranean climatologic zone only)

No recent information has been received from this country. Possible sites for inclusion in the Directory of Wetlands of International Importance would be:

1. Neretva Delta (Dalmatia):

Of limnological and possibly ornithological interest. No special protection.

2. Lake Scutari (Montenegro on border with Albania):

Of limnological and ornithological interest. According to MAR List (1965) internationally important wintering site for Anatidae (Anser albifrons). Pelecanus onocrotalus is probably still a rare breeding bird in this area. More information on ecology is needed.

3. Lake Dojran (Macedonia, border with Greece):

Of limnological and ornithological interest. More information on ecology is needed. Not protected.

4. Megalo Prespa (see Greece, Mikra Prespa):

5. Vrana Lake (Cres Island):

Of limnological interest.

Albania

Little is known about the remaining wetlands of this country. The former wetlands in the plain have apparently been drained for agricultural purposes (rice fields). The natural lakes on the border with Yugoslavia and Greece seem to be largely unchanged. These are Lake Shkoder (Scutari), Ohridka and Prespa.

Information would be appreciated on the presence of colonies of pelecans, herons as well as cormorants.

Greece

In a paper presented at the International Conference on the Conservation of Wetlands and Waterfowl at Heiligenhafen, Federal Republic of Germany, December 1974, Sevastos reviewed the Wetlands of International Importance as a habitat for waterfowl in Greece. In conclusion from the data obtained during observations at the various sites since 1963, nine wetlands were listed while two additional sites would need further investigation.

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1. Gulf of Arta, Ionian coast, Preveza: ± 40,000 Ha.

Wetland types	5, 7, 11
Criteria Heiligenhafen Conference	1a, (c), e, 2a, b, 3c, 4a

Of international importance to wintering Anatidae (especially Anas crecca, Anas penelope, Anas acuta, Anas clypeata, Aythya ferina) and coots (Fulica atra), Pelecanus crispus, Platalea leucorodia and many species of Limicolae. Important breeding area for several species of Ardeidae, and perhaps still a few pairs of Pelecanus crispus. Important migration stage for many aquatic birds.

Not protected. Marsh areas seriously endangered by drainage. A conservation plan for the entire area is being studied by the IUCN Working Group for Conservation in Greece.

2. Evros / Meric Delta, Greek-Turkish border: +3,000 Ha.

Wetland types	7, 9, 11
Criteria Heiligenhafen Conference	1a, e, 2a, 3a, b, c, 4a, b, c

Of international importance for wintering Anatidae, especially Anas platyrhynchos, Anas crecca, Anas penelope, Anas acuta, and Fulica atra. Breeding area for huge numbers of Ardeidae, Plegadis falcinellus, and other waterfowl. In migration seasons vast numbers of Ciconia ciconia, Grus grus and Limicolae.

The creation of the National Park Evros which will include a number of totally protected zones, is expected in the near future. A biological field station was inaugurated in September 1975. Close cooperation with the Turkish Government to coordinate the establishing of protected areas on both sides of the border would be welcomed, once the good relations between the two countries have been re-established.

3. The complex of lakes: Porto Lago, Bourou, Fanarion, Aroghi, Messi, Karakatzali, Mitrikou:

Wetland types	7, 11, 17, 18
Criteria Heiligenhafen Conference	1a, e, 2a, 3c, 4a, b

Of international importance to wintering waterfowl, especially Anas platyrhynchos, Anas acuta, Anas penelope, Anas clypeata, Anas crecca, Tadorna tadorna, Anser anser. Also Fulica atra and Phalacrocoracidae.

No protection yet but plans for the creation of a nature reserve at Lake Mitrikou are being studied. Touristical developments are a threat to Lake Fanarion.

4. Lake Kerkinitis:

Province Serrai	± 4,000 Ha.
Wetland type	16
Criteria Heiligenhafen Conference	1a, b, e, 2a, b, c, 3a, 4a

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The reservoir on the Strymon River is of international importance to wintering and breeding waterfowl. A project for the protection of the heronries has been studied by the IUCN Working Group for Conservation in Greece. The effects of further raising of the waterlevel should be closely watched.

5. The group of lakes: Volvis and Langada, east of Thessaloniki:

Wetland type	18
Criteria Heiligenhafen Conference	1a, 3c, 4a

Of international importance to wintering waterfowl, especially Fulica atra. Breeding area for several species of Ardeidae. Both pelican species (Pelecanus crispus, Pelecanus onocrotalus) are regularly observed during migration. The rare and perhaps endangered species Oxyura leucocephala has been observed here as well.

No protection at present, with the exception of two huge Platanus trees with a colony of Ardea cinerea in the strip of land between the two lakes.

6. Mikra Prespa National Park, on the border with Albania and Yugoslavia:

Wetland type	19
Criteria Heiligenhafen Conference	1c, d, e, 2a, b, 3a, b, c, 4a, c

Of international importance as a breeding site for waterfowl, in particular for Pelecanus crispus and Pelecanus onocrotalus, Phalacrocorax pygmaeus and several species of Ardeidae. National Park established in 1974. A biological field station will be in operation in 1976. A management plan for the Park is badly needed.

7. Lagoon of Gumburnou, east of Kavalla:

Wetland type	7
Criteria Heiligenhafen Conference	1c, 2b, 4a

Several small islands in this lagoon harbour the only known breeding site of a small colony of Larus melanocephalus in Europe outside the Black Sea since the big colony in the Axios/Loudias/Aliakmon Delta was destroyed by drainage in 1973.

A protection plan has been developed by the IUCN Working Group for Conservation in Greece.

8. Nestos Delta, east of Kavalla:

Wetland types	9, 18, (19)
Criteria Heiligenhafen Conference	1c, 2a, 4a

A number of freshwater lagoons with a great variety of breeding waterfowl. The Government has plans to create a scenic forest park in this area. Coordination for the protection of the lagoons would be necessary.

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9. Lake Kotichi, Ionian shore of the Peloponnesos:

Wetland type 7
Criteria Heiligenhafen Conference 1a, e, 2a, 4b

The only waterfowl habitat of international importance on the Peloponnesos since the lagoon of Agoulinitsa was drained in 1970. Especially important wintering site for Anas acuta and Anas clypeata.

Not protected so far.

The list of wetlands of international importance because of their ornithological merits should perhaps be extended with:

a) Axion/Aliakmon/Loudias Delta
b) Coast of Mesolonghion

Both areas, formerly very important, have been drained but it is likely that the areas outside the sea walls are of interest as feeding and roosting grounds for internationally important numbers of Limicolae during migration. This would need further investigation.

One more wetland should be added because of its limnological interest.

10. Lake Trichonis:

Provinces Trichonias and Mesolonghion
Wetland type 19
Criteria Heiligenhafen Conference 1e, 2a, 4?

Well preserved oligotrophic lake, used for water supply and recreation.

Not protected.

Turkey

This vast country with a rich variety in its geographical features has a great number of wetlands of international importance situated along the coast as well as inland on the plateau. A limited number has so far been described for inclusion in the IUCN Directory of Wetlands.

For the purpose of this meeting we will be dealing mainly with the wetlands situated near or along the coast of the Mediterranean.

1. Evros / Meriç Delta, Turkish-Greek border:

See under Greece. Gala Gölü is the largest freshwater lake of the Meriç Delta. Number of breeding birds is lower than on the Greek side where the habitat is more natural. The ricefields on the Turkish side attract many of the wintering birds as a feeding ground. Commercial fishing has lost its former importance because of drainage. A flood control project destroyed 80% of the natural character of this site. Some biological studies have been carried out by the Zoological Institute of Istanbul and Ege Universities.

Not protected. Some areas in military zone.

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2. Saros Körfezi, east of the Evros / Meriç Delta:

Wetland type	3 ?, 11 ?
Criteria Heiligenhafen Conference	1a

Of international importance to wintering waterfowl, especially Anas penelope. More detailed information concerning habitat, legal protection status etc. is needed.

3. Kusgölü (Lake Manyas):

Province Balikesir	
Wetland types	18, 23
Criteria Heiligenhafen Conference	1a, d, e, 2a, 3a, b, c, 4a, b ?

Outstanding site of international importance to breeding, wintering and migrating waterfowl. Huge colonies of Platalea leucorodia, Plegadis falcinellus and several species of Ardeidae. Pelecanus crispus (approximately 2000 pairs) are nesting on man-made platforms on trees. Other breeding species: Anas platyrhynchos, Anas querquedula, Anser anser, Phalacrocorax carbo, Phalacrocorax pygmeus etc. Breeding success depends on waterlevel in early spring.

Partly protected by Kuscennet National Park, located in north east corner of the lake. Over-fishing forms a threat. Use of pesticides in bordering rice-, cotton and wheatfields should be carefully controlled.

4. Apolyont Gölü, situated east of Kusgölü near Bursa:

Wetland type	18
Criteria Heiligenhafen Conference	1a

Of international importance as a wintering site for Anatidae, especially Mergus albellus and Aythya ferina.

Not protected. Heavy hunting pressure. More detailed information about this site is needed.

5. Marmara Gölü, inland lake north east of Izmir:

Wetland type	15 (?), 24 (?)
Criteria Heiligenhafen Conference	1a

Of international importance to wintering waterfowl, especially Anas crecca. Oxyura leucocephala was observed in 1973. The waterlevel of this lake is controlled. It is rich in fish.

Not protected. More detailed information is needed.

6. Menderes Delta:

Province Aydin	± 10,000 Ha.
Wetland types	7, 9
Criteria Heiligenhafen Conference	1a, e, 2a, 4 ?

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Of international importance as a wintering site for waterfowl during flooding in the cold season, especially Anas penelope, Anas acuta, Anas clypeata and Fulica atra.

Not protected. Heavy hunting pressure. Some drainage has been carried out which might lead to the loss of suitable waterfowl habitat in winter.

7. Goksü Delta, near Silifke:

Wetland type 9
Criteria Heiligenhafen Conference 1a

Of international importance to wintering waterfowl especially Anas penelope, Aythya ferina, Tadorna ferruginea, Fulica atra.

Not protected. Heavy hunting pressure. More detailed information about habitat and ecology is needed.

8. Tuzla lagoon)
Akyatan Gölü)
Akyayan) Delta of Seyhan and Ceyan Rivers:
Yumurtalik lagoons)

Wetland types 9, 7, 11, 23, 25
Criteria Heiligenhafen Conference 1a, c, d, e, 2a, c, 3c, 4a, b

Probably the most important wintering area for waterfowl in Turkey. Especially high numbers of Anas penelope, Anas acuta and Fulica atra. Main wintering area of Phoenicopterus ruber population breeding in Central Anatolia. Sea turtles lay their eggs on the sandy beaches in this area. The lagoons are rich in fish. Commercial fishing is taking place at Akyatan. Spraying of cottonfields may cause pollution of the water. Drainage of cotton and wheatfields may have effects on its suitability for waterfowl.

Not protected. Conservation measures should be implemented as soon as possible. More detailed information is urgently needed.

9. Emen Gölü, Gavsur Gölü, inland lake, north east of Adana:

Detailed information is lacking. Of international importance to wintering waterfowl especially Anas acuta.

Wetlands of International Importance especially as waterfowl habitat in Central Turkey (on their merits as a site for breeding, migrating and wintering waterfowl):

10. The complex of wetlands of Calti Gölü (Aythya ferina)
Bayindir Gölü (Aythya ferina)
Yesilova marsh (Tadorna ferruginea)

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11. Burdur Gölü	(Oxyura leucocephala) (Aythya ferina) (Fulica atra)
12. The complex of wetlands of Hoyran Gölü Karamik	(Fulica atra) (Fulica atra)
13. The complex of wetlands of Aksehir Gölü Cavascu Gölü	(Fulica atra) Geese spp. (Fulica atra)
14. Mogan Gölü	(Tadorna ferruginea)
15. Golbek	(Tadorna ferruginea)
16. Tuz Gölü	(Tadorna ferruginea)
17. Seyfe	(Fulica atra)
18. Palas Gölü	(Tadorna ferruginea)
19. Kurbaga Gölü	(Anas crecca Tadorna ferruginea)
20. Ergeli (Ak-Gol)	(Tadorna ferruginea)
21. Sultan Sazligi (partly protected)	(Pelecanus onocrotalus) (Phoenicopterus ruber)
22. Eber Gölü (some protection)	(Ardeidae Oxyura leucocephala Anas angustirostris)

Syria

Little information is available on wetlands in this country.

1. Sabkhat at Jabboul, south east of Haleb:

Wetland type	17
Criteria Heiligenhafen Conference	1a

In the winter of 1972 (December) Koning and Dyksen observed 2030 Anser albifrons at this site. Phoenicopterus ruber and Grus grus seem to winter here as well.

More detailed information is needed, also about ponds and dead branches of the river Euphrates which may have important numbers of waterfowl in winter.

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Lebanon

1. The marshland of Ammik (Békaa):

Wetland type	23
Criteria Heiligenhafen Conference	1e, 2a, c, 3a, c, 4a, b, ?

The only temporary marsh left in the Lebanon. Of botanical, ornithological and hydrological interest.

Not protected. Highly threatened by total drainage for agricultural purposes with the aid of F.A.O. Severe hunting pressure all year round.

Cyprus

1. Akrotiri, near Limassol:

Wetland type	17
Criteria Heiligenhafen Conference	1a, e, 2a, 3c, 4 ?

Important wintering site for Phoenicopterus ruber. Feeding and roosting area for large numbers of waders during migration periods.

2. Larnace Salt Lake, near Larnaca:

Wetland type	17
Criteria Heiligenhafen Conference	1a, e, 2a, 3c, 4 ?

Important wintering site for Phoenicopterus ruber. Feeding and roosting area for large numbers of waders during migration periods. There is no protection at the above mentioned sites. Hunting pressure is extremely heavy on the island.

Israel

1. Hula Swamp Nature Reserve, southern Hula Valley: 310 Ha.

Wetland types	18, 21
Criteria Heiligenhafen Conference	1b, e, 2a, b, 3a, b, c, 4a, b

Only remains of a marsh of over 5000 Ha drained between 1950 and 1960. Reconstruction of all biotopes of former areas is underway and should be completed in 1975. Breeding colonies of Ardeidae and of great importance to migrating pelicans. Wintering ducks approximately 15,000.

Research concentrating on rehabilitation of flora, breeding birds and migrating pelicans.

2. Beth-Saida, north east shore of Lake Kinnereth: 1000 Ha. marsh and 50 Ha. lagoons

Wetland types	12, 16, 18
Criteria Heiligenhafen Conference	2a, b, 3a, b, c, 4a

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Lake Kinnereth is of hydrological interest. The lake, streams and lagoons are rich in fish and have an interesting flora and fauna. Of importance to wintering waterfowl.

Beth-Saida is a nature reserve under special annually renewed contract. The Kinnereth Limnological Laboratory is the centre for a comprehensive limnological programme on the lake.

3. Dan River, Upper Jordan Rift Valley: length 9 kms.

Wetland type	13
Criteria Heiligenhafen Conference	1c, 2a, b, c, 4 ?

Of hydrological interest. State nature reserve at the site of the springs only. Variable rheophilous fauna. Extensive use for water supply and recreation are threats.

4. Nahal Arugot, Dead Sea Rift Valley: length 2 kms.

Wetland type	12
Criteria Heiligenhafen Conference	1e, 2a, 3b, (c), 4a

A desert stream of hydrobiological interest. (Field study of aquatic fauna). State owned nature reserve. Some danger of extensive exploitation for irrigation purposes.

5. En-Nur, a spring of the En-Sheva group on the northern shore of Lake Kinnereth:

Wetland type	
Criteria Heiligenhafen Conference	1d, e, 2a, b, c, 3a, 4a

Karstic spring flowing through a system of caves and crevices. Endemic subterranean fauna (most important element the blind prawn Typhlocaris galilea). State owned, protected by the Nature Reserves Authority.

6. En Feshka, Dead Sea Rift Valley: 2 km^2

Wetland type	14
Criteria Heiligenhafen Conference	1e, 2a, b, c, 3b, 4a

Rivulets originating from approximately 50 springs, with great variation in bottom substrate and water current. Rheophilous and stagnant water halophilous fauna with mixture of Palearctic and Ethiopian elements. State owned nature reserve. Extensive exploitation by tourist industry and antimalarial pesticide spraying form a danger.

Egypt

1. Sabkhet El Bardawil, Sinai:

Wetland types	7, 11
Criteria Heiligenhafen Conference	1a, e, 2a, c, 4a, b ?

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Important feeding and roosting area for waterfowl in migration periods. Breeding area for terns, gulls and waders. Feeding area for important numbers of Phoenicopterus ruber.

Not protected. Collecting of eggs and young birds by local fishermen. More information on ecology is needed.

2. Lake Edku, east of Alexandria:

Wetland type	17
Criteria Heiligenhafen Conference	1e, 2a, 3b, 4 ?

A eutrophic, brackish lagoon of limnological interest. Protected status unclear. State owned. Part of the lake is subjected to land reclamation. More information is needed.

3. Lake Quarun, western desert: ± 20,000 Ha.

Wetland type	17
Criteria Heiligenhafen Conference	1d, e, 2a, b, c, 3b, 4a ?

Of limnological and hydrobiological interest. The salt lake is situated 45 m. below sealevel. Successful acclimatisation of marine fish. State owned. Protected status unclear. Possible danger from increasing salinity. More information desirable.

4. Nile Delta:

No recent information is available on this wetland which, formerly at least, was of outstanding importance to breeding, migrating and wintering waterfowl populations. New data would be highly appreciated in order to determine its actual status.

Libya

The information on wetlands in this country is far from complete. It is doubtful that there are any wetlands which support internationally important numbers of waterfowl during the breeding, migrating or wintering season. The AQUA list mentions four sites which are of importance as refuges for underground or relict fauna.

1. Grotto of Lete, vicinity of Benghazi:

The underground water harbours the blind decapod Typhlocaris lethaea, its nearest relative being in Palestine and Apulia, southern Italy. Protected status unknown.

2. Oasis of Gat, southern desert:

Presence of afro-tropical fish (Hemichromis bimaculatus) and (Barbus deserti) and other fauna of tropical character.

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3. Oasis of Giarabub (Al Jaghbub):

Brackish pool with some molluscs of marine origin including the relict species Cardium edule rectidens arrasciensis. Protected status unknown.

4. Oasis of Cufra (Al Kufrah), southern desert:

Brackish pools with Artemis salina and other brackish water crustaceans.

The wetlands 2 and 4 are outside the Mediterranean climatologic region.

Malta

No information on wetlands on this island has been received. It seems doubtful that there would be any sites of international importance.

Tunisia

1. Lac de Tunis / El Bahira, Tunis: 4500 Ha.

Wetland type	17
Criteria Heiligenhafen Conference	1a, b, c, e, 2a, b, 3a, b, c, 4 ?

Of international importance to migrating and wintering waterfowl, especially Anas clypeata, Fulica atra, Phoenicopterus ruber, Phalacrocorax carbo, Recurvirostra avosetta. Of particular interest is the presence of very important numbers of the rare and perhaps endangered species Oxyura leucocephala in winter.

The amount of industrial effluent flowing into the lake is increasing rapidly. Most of the Tunis city sewer system empties into the lake, producing odours intolerable near a capital, particularly in summer. Any long-term solution requires a completely new sewerage plan for the city, but in the meantime, attempts are being made under the scientific direction of Professor Björk of Lund University to improve oxygen circulation. Shooting pressure is high because of the proximity of the capital. The lake has been declared a national reserve.

2. Lake Sejoumi, near Tunis:

Wetland type	17
Criteria Heiligenhafen Conference	1a, e, 2a, 3a, c, 4 ?

Salt lake on south west edge of Tunis of great importance to migrating and wintering waterfowl including Anas acuta, Anas clypeata, Tadorna tadorna. Phoenicopterus ruber present in winter in large numbers.

Not protected. Severe hunting pressure because of its situation near the capital.

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Large numbers of birds move from time to time to the nearby Sebkhet Ariana, especially Phoenicopterus ruber and Tadorna tadorna. Both lakes should be considered as an entity.

3. Lac Ischkeul: ± 12,000 Ha.

Wetland type	18
Criteria Heiligenhafen Conference	1a, b, c, 2a, b, 3a, b, c, 4a

The most important single wetland in North Africa. One of the last remaining freshwater lakes with the exception of a group of five lakes in north east Algeria, which once stretched across North Africa. Of international importance to huge numbers of wintering waterfowl especially Anser anser, Anas penelope, Aythya ferina and Fulica atra. Especially in severe winters in Europe thousands of aquatic birds find refuge here on the other side of the Mediterranean.

The lake is not protected yet. Plans for a national park exist but so far, only Djebel Ichkeul has been protected. Plans to dam the principal wadis (Ghezala, Joumine and Sedjenana) feeding the lake in order to provide water for irrigation would seriously affect the waterfowl habitat. It remains questionable whether suitable waterfowl habitat would form again after the waterlevel has been lowered, and the salinity has gone up.

4. Sebkha Kelbia: ± 13,000 Ha.

Wetland type	18
Criteria Heiligenhafen Conference	1a, 2a, b, 4 ?

One of the few freshwater areas in Tunisia that hardly dries out. Of international importance to huge numbers of wintering waterfowl, especially Anas penelope, Anas acuta, Anas clypeata.

Not protected. Silting up of the lake has been reported besides plans to use the water of the feeding wadis for irrigation purposes. Egg collecting by local people is another threat.

5. Sidi Mansour and Sebkhet En Noual: ± 3000 Ha., 11,000 Ha. respectively

Wetland type	17
Criteria Heiligenhafen Conference	1a, c, 2a, 4a

Salt lake in semi-desert country. Salinity is low in the eastern end. Waterlevel depends on amount of rainfall. Occasionally dries out completely. Of great importance to Phoenicopterus ruber in winter as a feeding area but breeding attempts have been reported. The rare and perhaps endangered Oxyura leucocephala winters in the area, also important numbers of Anas clypeata and Tadorna tadorna.

Not protected. Cereal crops are produced in the dried out eastern end of the lake in some years.

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6. Sidi El Hani: ± 25,000 Ha.

Wetland type	17
Criteria Heiligenhafen Conference	1a, e

Of international importance as a fairly regular breeding site for flamingoes (Phoenicopterus ruber). Not protected. Egg collecting by villagers is a threat to the colony.

7. Sebkhet El Djem: ± 3,000 Ha.

Wetland type	17
Criteria Heiligenhafen Conference	1a, e, 2a, 4a, b

Salt lake varying in size according to amount of rainfall. Of international importance as a wintering site for waterfowl, especially Aythya ferina and Fulica atra. The rare and perhaps endangered Oxyura leucocephala is wintering in appreciable numbers and has bred as well. In favourable years breeding colonies of several species of waders and gulls and terns.

Not protected. Egg collecting by villagers is a threat.

8. Complex including the coast between Sfax and Gabès, Thyna and the Kneiss Islands:

Wetland types	3, 7, 10, 11, 24
Criteria Heiligenhafen Conference	1b, e, 2a, c, 3c, 4a, b

The only area with big tidal movements in the Mediterranean and the muddy beaches and lagoons are an internationally important migration and wintering site for waders, herons, gulls and terns. Breeding birds include Egretta garzetta, Tringa totanus, Larus genei, Sterna hirundo and Sterna albifrons. The salines of Thyna which are directly near the sea are a roost at high tide.

Not protected. There exists an oil-refinery at Skhira.

9. Hot springs at El Hamma, Gabès district:

Wetland type	14 ?
Criteria Heiligenhafen Conference	1c, e, 2a, b, c, 3a, 4a, (b?)

Of international importance because of its hydrobiological interest. Only known habitat of Thermosbaena mirabilis, blind primitive representative of the Pancarida Crustacea, a hypogean.

There are several more sites of international importance to waterfowl although not of the same standing as the eight wetlands mentioned above. These are Chott El Fedjadi, and Sebkhet El Hamma (Phoenicopterus ruber bred here in 1974), Chott Djerid (also a breeding site of Phoenicopterus ruber, in 1959), Sebkhet Kourzia and Garaet El Kebira (feeding area for

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Phoenicopterus ruber and wintering area for Grus grus), Sebkha and salines of Monastir (wintering Anatidae and Limicolae), Mejerdah estuary (wintering area for Anatidae and Limicolae). Their importance is very dependent on the amount of rainfall.

Algeria

1. The wetland complex in the vicinity of El Kala including Lac Tonga, Lac Oubeira, Lac Mellah, Garaet Mekhada (Lac des Oiseaux) and the Barrage de Cheffia (on the Oued Bounamoussa).

	Wetland Types	Criteria
Lac Tonga	11, 18	1a, d, e, 2a, 3c, 4a
Lac Oubeira	18	1a, b, 2a, 3c, 4a
Lac Mellah	7	1a, b, d, e, 2a, 3c, 4a
Garaet Mekhada	7, 8, 12, 23	1a, b, c, d, e, 2a, b 3c, 4a
Barrage de Cheffia	16	1a, b, 4a

The wetlands are situated close to each other but show different characteristics.

Lac Tonga: fresh water marsh of ± 3000 ha with abundant vegetation and little open water, surrounded by wooded hills. Excellent example of a typical bio-community of a Mediterranean coastal wetland. Of great importance to wintering, migrating and breeding waterfowl which could well include scarcer species such as Anas angustirostris and Oxyura Leucocephala, Porphyrio porphyrio.

Lac Oubeira: eutrophic lake in a fresh water marsh of ± 2800 ha, surrounded by dense vegetation. Rich in fish and of great importance to migrating and wintering waterfowl, especially Podiceps ruficollis, P. nigricollis, Anas penelope, Aythya ferina, Egretta garzetta and Fulica atra. Plegadis falcinellus is an occasional visitor. No precise information available yet about the status as a waterfowl nesting area.

Lac Mellah: a salt water lagoon of 837 ha, connected with the sea. It has a submerged vegetation dominated by Ruppia spiralis. Rich in fish. Of great importance to migrating and wintering waterfowl, especially diving ducks (Aythya ferina, A. fuligula) and Fulica atra. Its importance as a breeding site needs further investigation. A considerable variety of mammals living in the direct surroundings, including Sus scrofa, is dependent on the wetlands.

Garaet Mekhada: a mixture of fresh and brackish shallow marshes covering several thousand hectares, with some lagoons, heavily overgrown with Scirpus, Phragmites and Typha. Dunes separating the wetland from the sea are covered with Halimium, Quercus sp. and Erica arborea. There are grasslands interspersed with Asphodelus spp. and grazed by cattle.

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A few patches of cultivation. Mammals include Felis silvestris and possibly Felis lynx pardellus, Sus scrofa and Cervus elaphus. Of great importance to migrating and wintering waterfowl especially Anas acuta, A. clypeata, A. crecca and A. penelope. Possible breeding species include Oxyura leucocephala and Anas angustirostris. Porphyrio porphyrio nests commonly. Birds of prey are unusually abundant and include Buteo rufinus, Circus aeruginosus, Hieraetus fasciatus and Neophron percnopterus.

Barrage de Cheffia: a fairly large (± 3000 ha) and deep impoundment in the hills bordering and overlooking the plains. Its importance is that it provides a refuge for waterfowl when shooting is in progress in the low-lying sections of the wetland complex. At such times very considerable concentrations have been observed, e.g. Anas penelope (up to 9,500), A. crecca (1,500) and A. acuta (3,500).

None of the wetlands of the El Kala complex have any form of protection so far. A project for a marine park and wetland reserve has been described by Nadia Bougazelli, Malika Djender and Jean-Pierre Thomas. Only the northern part of Lac Mellah is included in this project. It seems highly desirable to extend the plans for a national park to all wetlands in this area including their surroundings in order to save their valuable ecosystems.

2. Marais de la Macta:

Wetland types	8, 11, 12, 23
Criteria Heiligenhafen Conference	1a, c, 2a, 3c, 4 ?

Brackish coastal marsh that varied in size (3,000 ha - 15,000 ha) before it was drained in the early sixties. It was flooded again several years later and is at present a very important wintering site for Anatidae, especially Anas crecca, Anas penelope, and Fulica atra. Its status as a breeding site for aquatic birds is not well known and should be further investigated. A publication concerning the ecology of the wetlands of Oran including La Macta has been prepared by M. Metzmacher.

Not protected. Urgent protection measures are necessary. The industrial zone of Arzew is spreading rapidly along the coast towards the marsh. Grazing has increased.

3. Sebkha d'Oran: 50,000 - 150,000 ha, depending on the amount of rainfall

Wetland type	17
Criteria Heiligenhafen Conference	1a, 2a, 4 ?

Salt lake of international importance to migrating and wintering waterfowl, especially Anas acuta, Anas clypeata, Tadorna tadorna.

Not protected. Heavy shooting pressure. Establishing of reserves would be advisable.

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4. The wetlands of Sud Constantinois: 200,000 - 300,000 ha variable in size depending on the amount of rainfall

Garaet Et Tarf
Les Lacs
Sebkhet Hamiett

Wetland type	17
Criteria Heiligenhafen Conference	1a, b, 2a, 4a, b ?

A chain of wetlands of approximately 150 kms. long (El Sbikra, Garaet Et Tarf, Garaet Guellit, Garaet Ank Djemel, Sebkhet Djendli, Les Lacs, Chott Gadaïne, Chott El Beïda, Chott El Fraïn, Sebkhet Hamiett, Sebkhet Guellal). Important to migrating and wintering waterfowl, especially Tadorna tadorna, Anas penelope, Anas acuta, Fulica atra. Garaet Et Tarf is an important site for wintering Grus grus, and feeding area for Phoenicopterus ruber.

Not protected. Hunting pressure is high. Establishment of reserves would be advisable.

Other sites which should be included probably in the list of wetlands of international importance:

Guerbes Senadjas, (flora with boreal and tropical relict elements and several rare mammal species).

Chott Melrhir and Chott Merouane, (wintering waterfowl).

Chott Hodna, (wintering waterfowl).

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Morocco

1. Merja Zerga: ± 3,000 Ha.

Wetland types	3, 7
Criteria Heiligenhafen Conference	1a, e, 2a, 3c, 4a

Brackish lagoon separated from the sea by dunes but connected with it by a creek. Vast mudflats at low tide. The most important wintering and migration stage site (with the possible exception of Puerto Cansado) for Anatidae and Limicolae (especially Anas penelope) and Fulica atra, in Morocco.

Not protected. Severe hunting pressure. Protection measures would be highly desirable.

There are several areas of international importance nearby such as the Merja Sidi Mohamed Ben Mansour and Merja Daoura which have high numbers of wintering waterfowl as well. The Lagune de Mehdia is a narrow coastal marsh with surrounding wood and dense vegetation which is especially frequented by ducks, waders and other aquatic birds during migration. The rare Fulica cristata is breeding here. A project for its protection exists but has not been realised so far. Tourism is affecting the area badly (camping). Overgrazing is ruining the vegetation.

It would be advisable to study a plan for protection for the entire area.

2. Puerto Cansado: ± 5,000 Ha.

Wetland type	7
Criteria Heiligenhafen Conference	1a, b, c, e, 2a, 4a, b

Salty lagoon in communication with the sea and vast complex of mudflats and zones with Rupia spp. exposed at low tide. Very important site for sintering and migrating waders such as Haematopus ostralegus, Numenius arquata, Squatarola squatarola, Charadrius hiaticula, Charadrius alexandrinus, Calidris canutus, Calidris minuta, Calidris alpina, Limosa lapponica, Tringa totanus, Crocethia alba. Phoenicopterus ruber may breed in some years. The endangered species Numenius tenuirostris has been observed here in important numbers in 1964 (approximately 700).

Not protected. Roads are being constructed in this area which was formerly very remote. Some form of protection would be advisable.

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3. Lagune de Oualidia and Lagune de Sidi Moussa: ca. 1,000 Ha.

Wetland types	7, 24
Criteria Heiligenhafen Conference	1b, (c?), e, 2a, 4 ?

A series of lagoons separated from the sea by dunes and stone walls. Vast areas with Salicornia and here and there Phragmites. In some places oysters are cultivated in artificial ponds. Important site for migrating and wintering Limicolae. The endangered species Numenius tenuirostris was observed here in small numbers in 1964. Smaller numbers of ducks winter here as well, among which the uncommon species Anas angustirostris. Not protected.

4. Mouth of the Moulouya:

Wetland types	7, 10, 11, 12
Criteria Heiligenhafen Conference	1c, e, 4a

Lagoons and coastal marshland separated from the sea by dunes. Of botanical interest and as a habitat for aquatic birds in winter and during migration, especially Ardeidae, Platalea leucorodia, Tadorna tadorna, Casarca ferruginea and Limicolae.

Several hundred pairs of the endangered Larus audouinii nest on the island of Isabella, one of the Chaffarine islands, a Spanish possession off the Moulouya estuary. Not protected.

5. Lacs du Moyen Atlas, Azrou region: 500 - 800 Ha.

Wetland type	18
Criteria Heiligenhafen Conference	1a, c, d, e, 2a, b, c, 3c, 4a, b

The area comprises 36 mountain lakes of which Aguelmane Azigra, Aaoua, Hachlaff, Tifounassine, Sidi Ali, Affenourir and Annoceur are the most interesting. The lakes are permanent mesotropic, abundant underwater and surface vegetation. Besides their interest from a hydrobiological point of view, they are of great importance to aquatic birds on passage and often in winter as well. Data Annoceur has an important population of the rare Fulica cristata (2,000 January 1972).

Not protected.

6. Merja de Douiyet, Fez region:

Wetland type	18 ?
Criteria Heiligenhafen Conference	1c, 2a, 4a, b ?

A wintering site for the uncommon Anas angustirostris and rare Fulica cristata. Not protected.

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7. Lac Iseli, Haut Atlas:

Province Ksar	2 km2
Wetland type	19
Criteria Heiligenhafen Conference	2a, 4 ?

Of international importance because of its limnological and hydrobiological qualities. Not protected.

8. Lac d'Ifni, Haut Atlas:

Province Ouarzazate	0,35 km^2
Wetland type	19
Criteria Heiligenhafen Conference	2a, b, 4 ?

Of international importance because of its limnological qualities. Probably the only dimictic lake in Morocco, or even in North Africa.

9. Springs of the Oum er Rabia River, Moyen Atlas:

Wetland type	14 ?
Criteria Heiligenhafen Conference	1e, 2b, c, 4 ?

Of limnological and hydrobiological interest. Interesting halophile flora and fauna. Not protected.

Conclusion

The picture emerging from this preliminary review of wetlands of international importance in the Mediterranean area is undoubtedly alarming.

Of the main concentration areas for wintering and migrating waterfowl only two sites seem to have a satisfactory level of protection. These are the Camargue, France and the Hula Swamp Reserve, Israel. (See figure 2). The future of the National Park Coto Donana in the Marismas del Guadalquivir, Spain is becoming more and more compromised by developments in its direct durroundings. It is hoped that solutions can be found in time to stop the degradation of this unique site in Europe.

Of the protected breeding sites for waterfowl only Lake Manyas, Turkey seems to meet the standards and hopefully, in the near future; also Lake Mikra Prespa, Greece, if the regulations of the National Park are fully implemented.

The loss of any of the major concentration areas for wintering and migrating waterfowl populations in the Mediterranean will most probably lead to a serious decline of the population of one or more species of duck and other aquatic birds.

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These areas are:

Spain	Marismas del Guadalquivir / Coto Donana; Ebro Delta
France	Camargue
Greece	Gulf of Arta; the complex of lakes Porto Lago, Bourou, Fanarion, Aroghi, Messi, Karakatzali, Mitrikou; Lake Kerkinitis; Evros / Meriç Delta
Turkey	Evros Meriç Delta; Menderes Delta; Göksu Delta; Ceyhan and Seyhan Deltas and lagoons of this area
Israel	Hula Reserve
Egypt	Nile Delta
Tunisia	Lac Ischkeul; Lac de Tunis / Lac Sejoumi; Coast between Sfax and Gabès / Kneiss Islands; Sebkha Kelbia
Algeria	The Complex of wetlands including Lac Oubeira, Lac Tonga, Lac Mellah, Garaet Mekhada, Barrage de Cheffia; La Macta
Morocco	Merja Zerga

All of these sites, with the exception of the Camargue and the Hula Swamp which are already protected, should rank high on the priority list for conservation.

Maximum attention should be given also to sites that harbour rare or endangered species of plants and animals. Nesting sites of colony breeding birds such as pelicans, flamingoes, cormorants, herons, ibisses, gulls, terns etc., are extremely vulnerable and their conservation would also be a priority.

An action plan leading to the establishing of a network of protected sites of international importance should be considered during the Conference. Recommendations to governments concerning the creation of such protected areas should be drawn up during the working session.

Finally, the attention is once more drawn to the Convention on Wetlands of International Importance, especially as waterfowl habitat which has come into force on 21 December 1975. Of the Mediterranean countries, Greece already has become a party by signing and ratifying this agreement. It is expected that Italy which has signed but not yet ratified, will follow shortly.

It is hoped that the governments of all Mediterranean countries realizing that wetlands, besides being part of the national heritage of their countries, have a function of which the importance reaches often far beyond the national borders, will follow the example and become parties to this Convention in the near future.

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Annex I

Directory of Wetlands of International Importance

Classification of Wetland Types

The classification system adopted is based on the main natural complexes distinguished by Isakov (1). These physical-geographic elements are readily distinguished and will be used to simplify the descriptions in the Data Sheets of the Directory. Some wetland areas may include several wetland types.

Although in the initial stage of compilation of the Directory, special attention is being given to wetlands of importance as waterfowl habitat, no attempt has been made to distinguish the types of habitat which comprise the next level of classification in Isakov's scheme, nor to refer to the vegetation which is of vital importance as food and shelter. In this latter connection, attention is drawn to the wetland types (2) adopted by the Fish and Wildlife Service of the U.S. Department of the Interior for its inventory of wetlands in the United States.

The U.S. classification has some attractive features but it has been decided to adhere initially to the physical-geographic units rather than to differentiate habitat types. The U.S. classification is roughly compatible with the present classification but its units are not completely equivalent to the units adopted here.

Coastal Areas

Open sea shallow waters

1. Inter-tidal zone of open sea shallow waters.
2. Permanent shallow waters in open sea.

(i) Yu A. Isakov, "Problems concerning the Typology and Evaluation Survey of Waterfowl Habitats", Proceedings of the Meeting on International Cooperation in Wildfowl Research, Jabonna, Poland, 1966, published by International Wildfowl Research Bureau, pp. 67-72. See also Gisela Eber, "Zum 'Vorläufigen Schema der Typologie und Klassifikation von Wasservogelbiotopen'", Ornithologische Mitteilungen, 21 (4): 69-78 (1969).

(ii) Samuel P. Shaw and C. Gordon Fredine, Wetlands of the United States. Their extent and their value to waterfowl and other wildlife. Circular 39, Fish and Wildlife Service, U.S. Department of the Interior (U.S. Govt. Printing Office, Washington D.C., 1971).

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Sea bays and straits

3. Shallow sea waters, bottom uncovered at low tide.
4. Deep sea bays (fiords).
5. Shallow sea bays (always covered).
6. Fresh and brackish water bays.
7. Lagoons, both salt and fresh (including artificial lagoons).

Mouths of rivers

8. Tidal estuaries.
9. Deltas.

Coasts

10. Small islets.
11. Continental and large island coasts (including coastal marshes, dunes, rocky or sandy shores).

River Valleys

Rivers and flood plains

12. Lowland rivers (meandering), (including flood plains and interior or dry deltas).
13. Mountain rivers.
14. Brooks.

Storage reservoirs

15. Storages with relatively stable level of water.
16. Storages with great changes of water level.

Other Areas

Lakes

17. Salt lakes (including periodical intermittently fresh lakes).
18. Fresh eutrophic lakes (including periodical intermittent lakes never salt).
19. Fresh oligotrophic lakes.
20. Fresh dystrophic lakes.

Mires

21. Fen and transitional mires.
22. Peat bogs.

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Temporary waters

23. Temporary waters from snowmelt or rainfall (wherever situated).

Artificial ponds

24. Ponds (including fish, mill and farm ponds) and small reservoirs.
25. Irrigation and drainage systems (including rice fields, drainage ditches and pits with water).

Each dot marks a 10 km grid square in which January counts of waterfowl were made in one or more years: 1967-1973.

Figure 1

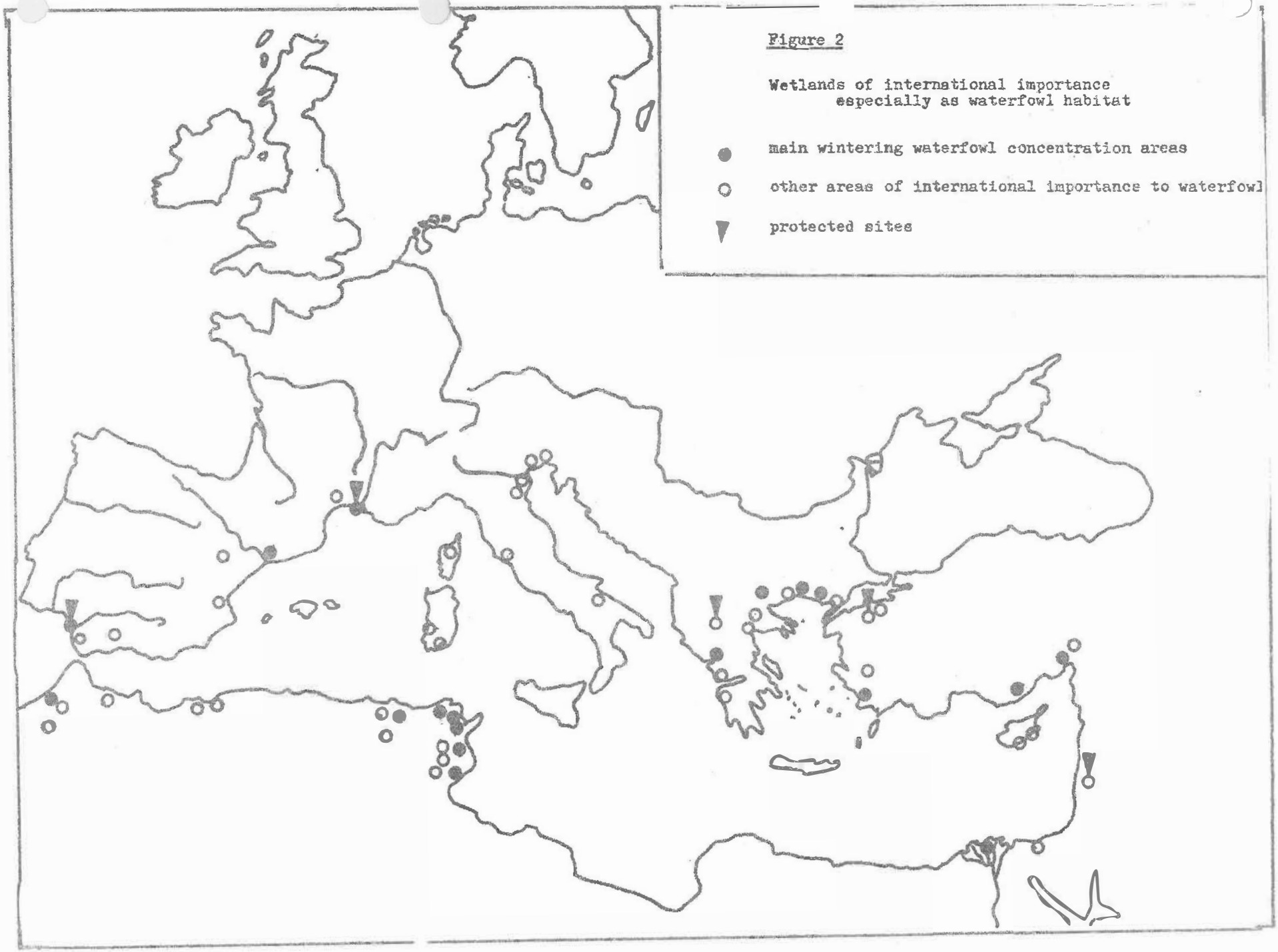
Figure 2
Wetlands of international importance
especially as waterfowl habitat
main wintering waterfowl concentration areas
other areas of international importance to waterfowl
protected sites