

**ENVIRONMENTAL PROTECTION IN THE AREA OF HELLENIC AIRPORTS  
AND AIRFIELDS - RULES AND LEGISLATION**

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**Abstract**

Similarly to most airports and airfields world-wide, the Hellenic ones are established on flat areas that are adjacent to wetlands or other natural resources. The majority of these wetlands or resources subject to various conservation and protection states.

An overview of these areas is presented by the use of GIS software, and the conservation rules for each of them are demonstrated. The authors also provide an outline of the efforts to obtain aviation safety within conservation tolerance.

**Key words:** Hellas, Greece, aviation safety, bird hazard control, environmental protection, conservation, Hellenic airports, Hellenic Air Force, wetlands, natural resources, Geographical Information Systems

(This paper is the work of the authors and may not reflect the full and final views of the organisations, by which they are employed)

## 1. Introduction

The area of Eastern Mediterranean has been subjected to a significant number of transformations during various geological periods. As everybody can see through a view in the map of Hellas, those transformations concluded to a great number of islands, a coastal line that includes a significant number of bays and gulfs, and many high mountains. All these geophysical formations resulted to insularity and consequently to the development of many segregated habitats. Some of these habitats are flat areas restricted between mountainous masses or between the mountains and the sea, while others have been created through the years at the estuaries of the numerous rivers.

Population increase through the years resulted in the creation of settlements in many of these flat areas. The settlements became cities and the growth of the cities was based on the transportation infrastructure. The development of aviation during the previous century contributed to the establishment of many airports, which solved the problems of insularity and contributed to the further economical, sociological and touristic development of many of the cities and the adjacent areas. The majority of the airports were established either near the sea or close to significant wetlands mainly based on international criteria.

The construction of fences was an adequate measure to keep land vertebrates away from the airports and airfields but they have no effect against avifauna. During the early years of aviation in Hellas birds were not posing serious hazards, for the same reasons as for the rest of the world. The increase of air traffic was accompanied by the development of conservation policies and regulations; thus, it soon became evident among the aviation community that conservation measures should take into account safety requirements.

The interactions between wildlife conservation are becoming more intense under the general climatic shifts recorded during the last decades. These shifts are showing different expressions of the weather parameters (changes of mean minimum or maximum temperatures, increase of precipitation and mean wind intensity, etc) at the various geographical regions of the country. Regardless whether these shifts are part of a global climatic change or not their results are obvious as species diversity and population numbers of birds in some wildlife sites are increasing.

This paper is part of an effort to provide a comprehensive approach to the field of Bird Strike Hazards in Hellas. It is related to other papers submitted for the 26<sup>th</sup> IBSC Meeting and its main scope is to:

1. List the regulations and laws established for the conservation and the management of the wildlife sites.
2. Provide an outline of those sites that are adjacent to the main airports and airfields in Hellas.
3. Demonstrate the interactions that exist between the safe operation of the airports and the management of the wildlife sites.
4. Promote the co-operation of all the agencies that are involved in the management of the environment, including aviation authorities (Hellenic Civil Aviation Authority, Air Force, Airport Management).
5. Raise awareness on the possible effects of the climatic changes on the wildlife sites in Hellas and provide guidance for the initiation of avifauna monitoring studies that will identify new potential hazards for aviation or the increase of those already identified.

## 2. Methodology

The realisation of a comprehensive approach to the major issue of studying and understanding the bird strike hazards on a national level, in order to attempt risk assessment and propose managerial guidelines, is obviously complicated. The background requirements are:

1. Justification of the environmental laws and regulations that apply conservation and managerial rules in the above mentioned sites.
2. Detection of the wildlife sites adjacent to airports and airfields that are affecting aviation and identification of their components (in this case bird species and their behaviour).
3. Identification of the possible interactions between the management of the wildlife sites and aviation safety.

### 2.1 Environmental Laws and Regulations

The first laws concerning the protection of the natural environment were published in the early '70s, the most important action being the delimitation of ten (10) National Parks and the management of game resources. Gradually the existing legislation was enriched with the ratification of the International Conventions and the European Directives and Regulations. The most recent laws refer to the establishment of agencies, which will be responsible for the administration and the management of protected areas.

The legislative background concerning the Protection of the Natural Environment in Hellas, is separated in two levels:

1. General Legislation, which includes laws and regulations, which are general or apply on a wide range of targets (e.g., on all protected areas).
2. Specific Legislation, which apply either to specific components of the environment (e.g., Avifauna) or to a restricted range of targets (e.g., Forest areas or Mediterranean habitats).

The existing laws and regulations are listed in Table 1 in the Appendix.

### 2.2 Detection of Wildlife Sites

The majority of large-scale wildlife sites that are protected by conservation rules have been included in the NATURE 2000 Network. The data collected during the previous decade in the respective database have been accessed and the avifauna information has been extracted. According to these data, there are fifteen (15) wildlife sites adjacent to airports and airfields and their avifauna activities are potentially affecting aviation safety. The presentation of the complete lists with the bird species for all these wildlife sites would result to a very long paper. Therefore, only restricted information concerning the above mentioned wildlife sites is listed in Table 2 in the Appendix, together with their area and the adjacent airports. Their conservation status based on the existing legislation, a short description, and avifauna groups and number of bird species per site are also included.

More details concerning bird activities recorded in the major wildlife sites are presented in the Results and Discussion part here below, where reference is made to the presence of birds that are potentially dangerous for aviation.

It has to be pointed out that the study and presentation of the information concerning avifauna in the wildlife sites adjacent to airports, that is extracted from the NATURA 2000 Network archives, is incomplete for the following reasons:

1. Although the NATURA 2000 Project has used all the available resources for recording the ecosystems' components of the wildlife sites in the country, there are some sites for which few or no data concerning avifauna are available. This lack of information is not considered as absence of potentially hazardous bird activities. The absence of such data is related to various

delimiting factors (time constraints, accessibility problems, etc.) that restricted the proper performance of the respective surveys that would lead to complete archives.

2. Although the population numbers of some species recorded in the major sites are more or less stable, it is considered that the data collected will be subjected to revisions.
3. Further to the bird species that are included in the conservation lists there are a few species (e.g., gulls or doves) that are abundant and although not recorded they are present at many sites as reported by airports' staff.

### 2.3 Use of ESRI ArcMap-ArcView GIS software

In order to facilitate the visualisation of the wildlife sites in the vicinity of the Hellenic airports and airfields, and to study and demonstrate the interactions between the bird activities and the operation of the airports the ArcMap-ArcView 8.2 GIS software of ESRI has been used.

## 3. Results and Discussion

### 3.1 Legislation and Management of the Natural Environment

Although the first attempts to protect the natural environment in Hellas were made in early '70s, the laws issued during those years were more or less general. The delimitation of the National Parks, the Aesthetic Parks and the Conserved Monuments of Nature in 1971 was a significant step towards this direction. The next steps on national level followed in the early '80s with the publication of the first lists of protected species (PD 67/1981) and later an Environmental Policy was established through the law 1650/1986. Meanwhile the ratification of International and European Conventions was supporting additional wildlife management policies.

However, till the recent decade few things were done for the foundation of agencies or authorities that could undertake the responsibility to apply comprehensive management at the wildlife areas included in the conservation lists. National and Aesthetic Parks, Game Refuges, and Hunting Control were under the Ministry of Agriculture (Forest Authorities). The delimitation of a few more protected areas that followed the establishment of the National Environmental Policy came under the responsibility of the Ministry of Environment, Planning and Public Works (while the existing areas remained under the responsibility of the Forest Authorities).

The involvement of different authorities in the protection of the natural environment resulted in conflicts, which in their own turn resulted in delays to establish the proper managerial programmes. It was only recently (3044/2002) that the first agencies for the administration and management of 25 wildlife areas were established.

### 3.2 The most important wildlife sites in the vicinity of airports and their conservation status

**Amvrakikos Kolpos** including the **Deltas of Louros and Arachthos** at Ipiros, the **Delta of Evros** at Thraki and the **Delta of Nestos** at eastern Makedonia (including the adjacent lagoons) are three of the largest wildlife sites adjacent to airports. **Amvrakikos Kolpos** is at the vicinity of the airport of Aktio (Preveza), the **Delta of Evros** is adjacent to the airport of Alexandroupolis, and the **Delta of Nestos** is close to the airport of Chrysoupolis (Kavala).

The **Amvrakikos Kolpos** (Gulf) extended area has the highest diversity in bird species from all the Hellenic wildlife sites, while the rest of the two above mentioned sites have also very high bird species diversity (see Table 1, in the Appendix).

The majority of the raptors present in these three sites are *Accipitridae* mainly Eagles, Buzzards, Hawks, and Harriers, while Falcons are also recorded.

From the waterfowl *Anatidae* (both *Anserinae* and *Anatinae*), Rallidae (mainly Coots) Ardeidae, Ciconiidae, and Pelecanidae consist the majority of the large size birds. At the **Deltas of Evros** and **Nestos** significant numbers of Greater Flamingos have also been recorded wintering on the sites.

Significant are also the numbers of *Charadriiformes* (*Sandpipers, Plovers, Lapwings, Gulls, Terns, etc.*) and of Starlings.

Concerning their conservation status, besides their inclusion to the NATURA 2000 Network, all three of the above mentioned wildlife sites are Ramsar wetlands, Special Protected Areas according to CD 79/409, Special Protected Mediterranean Habitats (Barcelona Convention). Recently special agencies have been instituted for their management according to Law 3044/2002 (see Tables 1 and 2 in the Appendix).

**Limnes** (lakes) **Voukaria** and **Saltini** are two small lakes, at western Sterea Hellas, very close to Amvtrakikos Kolpos. Although the diversity in bird species recorded on this site is relatively low (21 species recorded) the bird activity of the two lakes is connected to the adjacent **Amvrakikos Kolpos** since they both share a number of same species.

From the conservation point of view the site is only included in the NATURA 2000 Network.

**Limnothalassa** (lagoon) **Angelochoriou** is adjacent to the airport of Thessaloniki. Although it covers only a restricted area (it is the smallest of the wildlife sites included in this paper), there is significant and high bird species diversity.

Ducks, Herons, Cormorants, Gulls and Starlings are the birds showing the highest population numbers in the area.

From the conservation point of view, part of the area is a Game Reserve (law 177/1975) and the whole area has been included in the NATURA 2000 Network.

Although the core of the extended area of the **Axios, Loudias and Aliakmonas Deltas**, is 22 km E of the airport of Thessaloniki, part of the wetland is within the 13 km cycle from the airport site. In addition, since it hosts a significant number of waterfowl, their movements (daily or seasonally) are influencing air traffic at the lower altitudes in the vicinity of the airport.

Significant colonies of Herons, Pelicans, Grebes, Plovers, Sandpipers and Gulls, are recorded on the site. Large numbers of Ducks, Swans, Pelicans, Cormorants and Starlings are also wintering there. The presence of Hawks, Buzzards, Eagles, Harriers, and Falcons has also been recorded.

Besides its inclusion in the NATURA 2000 Network, the site is a Ramsar Wetland, Special Protected Area according to CD 79/409, Special Protected Mediterranean Habitat (Barcelona Convention). Recently an agency has been instituted for its management.

**Limni Kastorias** (western Makedonia) is a lake close to the city of Kastoria and in the vicinity of the respective airport and sustains a significant number of birds species (see Table 1 in the Appendix).

The lake hosts colonies of Herons, Sandpipers, Ibises, Ducks, and Gulls, while significant numbers of Cormorants, and Coots are wintering there. The presence of Buzzards, Eagles, Falcons and Harriers is also noticeable.

The site is included in the NATURA 2000 Network, while part of it is a Game Reserve.

The site of **Limnothalassa Kalogrias, Dasos** (woodland) - **Elos** (marsh) **Strofilias** and the site **Limnothalassa Kotychi**, are in the vicinity of the Araxos and Andravida airport at western Peloponnisos. The bird species diversity in both sites is high and they are considered as more or less connected, as the distance between them is short.

Both areas are significant for Herons, Ducks, Ibises, Pelicans, Terns, Sandpipers, Gulls, Starlings, Harries and Falcons.

Both sites are Ramsar Wetlands, Special Protected Areas according to CD 79/409, and Game Resources, while the site Limnothalassa Kotychi is also Special Protected Mediterranean Habitat. One agency for the administration and management of both sites has been instituted by law 3044/2002.

**Oros** (mountain) **Parnitha** (north-west Attiki) is the only National Park adjacent to an airport (Tatoi) and hosts a low number of bird species.

Small numbers of Eagles, Hawks, Buzzards and Falcons are present.

As already mentioned above the site is a National Park, it is included in the NATURA 2000 Network, and is a Special Protected Area according to CD 79/409. Finally an agency has been established for its management.

The lakes **Chortarolimni and Limni Alyki**, at eastern Limnos close to the airport, form a wildlife site where a low number of bird species has been recorded. They are salty and during the summer are partly drained.

Herons, Sandpipers, Shelducks, Avocets, Gulls, Falcons and Buzzards are the birds mainly recorded in this site. However, there are recent references about the presence of Flamingos, and Swans.

The site is only included in the NATURA 2000 Network, without any conservation measure applied on it.

Located on eastern Lesvos the site including the **Kolpos Geras, Elos Ntipi and Oros Olympos**, is in the vicinity of the airport of Mitilini. According to the available information this site has very low bird species diversity.

Only the presence of Herons, Shelducks, and Storks has been recorded in this site, which is not subjected to any conservation measure, other than been included in the NATURA 2000 Network. This site is certainly one of the cases mentioned above (2.2) as poorly studied.

The site **Kasos and Kasonisia** covers the whole island of Kasos (southern Aegean) and the nearby islets.

Eagles, Falcons, Cormorants and Gulls are mainly recorded on this site.

The area is only included in the NATURA 2000 Network and probably represents another poorly studied site. The isolation of the island (during the winter the access is very difficult) is a reason for that.

**Akrotirio** (cape) **Louros – Limni Psalidi – Oros Dikaiois** is a site that covers the major eastern part of the island of Kos (Dodekanisa) and is adjacent to the airport. The available data show a low bird species diversity.

Eagles, Buzzards and Falcons have mainly been recorded in this site.

Part of the area is a Game Resource, while the site is only included in the NATURA 2000 Network.

At the eastern part of Central Kriti, close to the airport of Kastelli (Irakliou) is situated the site of **Dikti: Oropedio** (plateau) **Lasithiou, Katharo, Selena, Krasi, Selakanos**, which shows a low bird species diversity.

This area is hosting significant numbers of Vultures, Eagles, Buzzards and Falcons.

No conservation measures apply on this site, other than its inclusion in the NATURA 2000 Network.

### **3.3 Management of the Natural Environment and Airports**

Although during the '70s and the early '80s the air traffic at many airports was low, the problems with the activities of birds were obvious. Among the existing conflicts for the management of the wildlife areas, airport authorities (HCAA and Hellenic Air Force) had very low influence on the decision-making. Their influence was restricted only on the airport site, while the measures they could use were usually short term, since long-term measures have to be combined with land management outside the airport site.

The preferred bird control measures were mainly environmentally friendly like long-term habitat management (e.g., landscaping, facilities maintenance, etc.) and short-term bird disperse actions (e.g., the use of gas cannons, recorded sounds, and shotgun blanks, while recently falconry has been introduced by Hellenic Air Force on some airfields). It has to be pointed out that although through the provisions of the Ministerial Decision 414985/1985 it was possible for all airports to obtain special permits to hunt all the bird species foraging on the airports, no such permit has been issued. The above-mentioned actions are part of the contribution of the airport authorities to environmental protection.

Nevertheless, till now, neither the management of the wildlife sites, nor the decisions for the extension of existing airports (or the creation of new) has considered the potential hazards that will be posed by the presence of birds in vicinity of the airports, in order to prepare the respective risk management measures.

### **3.4 Interactions between the management of the wildlife site and the operation and development of the adjacent airports**

The protection and management of the wildlife sites mentioned above, will result to an increase of the numbers of birds on them, especially in the cases where no conservation measures had been applied before, or the applied measures were incomplete or not carefully monitored. In addition, climatic shifts are already providing indication of the establishment at some sites of new colonies of species not previously recorded, like the recent colonisation of the wetlands of Limnos and Lesvos by Flamingos.

On the other hand Environmental Impact Assessment guidelines are not fully aware of the fact that Bird Strikes are significant potential sources of environmental mitigation. A bird strike further to the lethal results on protected species may have greater consequences for the aircraft and passengers in the case of an adverse event.

The study of the bird species on major wildlife sites close to airports with significant air traffic compared with the data delivered by the airport authorities and the available bird strike data of recent years (1997-2000) clearly indicates the following:

1. The increase of air traffic on airports close to wildlife sites with high concentration of birds will increase the probability of a bird strike.
2. The possible increase of population numbers of birds at the above mentioned sites will also increase the probability of strikes.
3. The increased probability for a bird strike cannot be faced only by the airport authorities, with long- or short-term measures applied on site. Wildlife Habitat Management should consider the aviation safety requirements and apply the proper planning.

## 4. Conclusions

Forced by the necessity to connect remote areas, a significant number of Hellenic airports have been established close to wildlife areas where significant colonies of birds potentially hazardous for aviation are present.

All of these wildlife areas are included in the NATURA 2000 Network, while some of them are also under additional conservation states concerning national or international laws and regulations. The majority of them are well studied in terms of bird activities, while for a small number of them further surveys are needed. The bird control measures applied on the various airports are mainly supporting nature conservation.

However, the interactions between the existing bird activities at the above mentioned areas and the operation of the adjacent airports have not yet been fully studied, while changes either in the use of the airports (e.g., extension) or in the conditions of the wildlife areas (e.g., better management, new colonies, climatic changes, etc.) are expected to alter the existing status on some of them.

Under these circumstances the following should be considered:

1. Further studies are required for each site concerning the populations of the birds and their activities including movements (diurnal, short- or long-term movements) and also social pattern and behaviour, unless such data are available by various ornithological societies or university institutions.
2. Monitoring programmes should be established on the airports to record the population numbers, the characteristics (mainly size) and the behaviour of the birds foraging on them in order to realise the interactions with the adjacent wildlife sites. Bird identification is necessary during these programmes, however since specialised resources (ornithologists, field guides, etc) may be required, a quick first approach classifying populations numbers and bird sizes according to ICAO IBIS recommendations (e.g., pop num.: 1, 2-20, 11-100 – sizes: small, medium, big) would provide significant data for the first actions.
3. Risk Assessment and Management studies are required for each case identifying the hazards and the contribution of the stakeholders.
4. A general strategy should be planned at the national level concerning birds strike risk assessment, which will study each airport case separately and work out risk management and reduction measures.
5. In the frames of the above-mentioned strategy, representatives of the aviation community (i.e., HCAA, Air Force, Airport Authorities, and Airlines) and specialised ornithologists should be included in the agencies that will undertake the task to administrate and manage wildlife sites close to airports.

## 5. Follow-up

As mentioned above this paper is a first approach in a global attempt to prepare studies that will increase awareness on hazards posed by bird activities in the vicinity of the airports by:

- Defining the risk stakeholders and their responsibilities for risk management, and
- Promoting co-operation of all authorities involved.

The continuation of this effort with more detailed studies on potential interactions between wildlife and operation for each airport is considered essential, not only considering the increase of the number of flight and/or the increase in the population numbers of birds in the vicinity. The Hellenic State is planning to enlarge some of the existing airports (e.g., Thessaloniki, Araxos) and probably building new ones. At the same time there are plans for restoring lake Karla (situated in southern Thessalia

close to the airport of Nea Achialos), which was drained in the middle of the previous century, in order to create a new water reservoir for agriculture. In such cases the interactions between bird activities and airport operation must be considered.

## 6. Acknowledgements

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## 7. References

- ANONYMOUS 1991: Wetlands in Greece - National Technical University of Athens, Department of Rural and Surveying Engineering, Diploma Thesis.
- BERIATOS, E. 2003: Managing Authorities, of Protected Areas in Greece: Problems and Perspectives HELECO '03 Meeting Athens 30/1-2/2.
- HELLENIC AIR FORCE 1996: Bird Strike Manual.
- HELLENIC AIR FORCE 1998: Birds Immigration.
- ICAO 1985: Airport Planning Manual: Part 2 "Land Use and Environmental Control". - Second edition
- ICAO 1989: Manual of the ICAO Bird Strike Information System (IBIS) – Third Edition.
- ICAO 1999: ANNEX 14 to the Convention on International Civil Aviation: -AERODROMES: Volume I – Aerodrome Design and Operation. – Third Edition.
- K. KASIOUMIS 1994: Legacy of protected areas in Greece – National Agricultural Research Foundation (NAGREF).
- MINISTRY OF ENVIRONMENT, PLANNING AND PUBLIC WORKS 1999-2000: NATURA 2000 Network Database – Group 4.
- NIKOLAIDIS, E. 2000: "Bird Strikes in Greece 1997-1998"- In Proceedings of the 25th International Bird Strike Committee Meeting, Amsterdam 17-21 April.
- NIKOLAIDIS, E. 2003: " Bird strike statistics in Hellas civil aviation 1999-2000"- In Proceedings of the 26th International Bird Strike Committee Meeting, Warsaw 5-9 May.
- VASSILAKIS, K., M. PANAGIOTOPOULOU & G. TSAKONA (eds.) 1994: Important Sites for the Birds in Hellas: An introduction to the Major Habitats in Hellas – Hellenic Ornithological Society, Athens.

## APPENDIX

**Table 1.** List of laws and regulations for the protection and management of natural environment in Hellas. The sequential numbers at the left column are used as reference numbers in the paper

Reference number	International Conventions
1	International Convention for the Protection of the Birds (Paris 1950)
2	Convention for the Conservation of Migratory Species of Wild Animal (Bonn 1979)
	<b>National Legislation</b>
	<i>General</i>
3	Law 860/1976 regarding Planning and Environment
4	Presidential Decree 67/1981 for the Protection of Wild Flora and Fauna and the determination of the procedures for the co-ordination of the Management and Research on them
5	Law 1126/1981 for the Ratification of the Convention concerning the Protection of the World Cultural and Natural Heritage, signed in Paris in 1972
6	Law 1335/1983 for the Ratification of the Convention for the Conservation of European Wildlife and Natural Habitats (Bern Convention)
7	Law 1650 /1986 for the Protection of the Environment
8	Common Ministerial Decision 69269/5387/1990 for Initial Approval of Planning and Environmental Impact Assessment Studies
9	Law 2204/1994 for the Ratification of the Convention for the Conservation of Bio-diversity signed in Rio de Janeiro in 1992
10	Ministerial Decision 33318/3028/28-12-98 for the Ratification of CD 92/43 EEC on the Conservation of Natural Habitats and Wild Fauna and Flora.
11	Law 2742/1999 regarding Land-planning Issues and Provisions for the Administration and Management of Protected Areas
12	Law 3017/2002 for the Ratification of the Kyoto Protocol of the United Nations Framework Convention on Climate Change
13	Law 3044/2002 includes the Establishment of 25 Agencies for the Management of equal Protected Areas
	<i>Specific</i>
14	Provision of Law 86/1969 regarding the National Forest Policy
15	Provision of Law 996/1971 for the Creation of "National Parks", "Aesthetic Parks" and "Preservable Monuments of Nature"
16	Provision of Law 191/1974 for the Ratification of Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Treaty) and Amendments through the laws 1751/1988 and 1950/1991
17	Law 177/1975 for the Protection and Preservation of the Natural Environment and the Conservation, Development and Exploitation of the Game Resources
18	Law 998/1979 for the Protection of the Forests and Woody Areas
19	Common Ministerial Decision 414985/1985 for the establishment Measures for the Management of Wild Birds and the Ratification of the Council Directive 79/409/EEC for the Conservation of Wild Birds
20	Law 1634/1986 for the Ratification of the Protocols of 1980 "for the Protection of the Mediterranean Sea from Pollution from terrestrial sources" and 1989 "Regarding the Special Protected Areas of Mediterranean" (Barcelona Convention)
21	Law 2055/1992 Accession to the Convention on International Trade in Endangered Species of Wild Fauna and Flora

**Table 2.** *List of wildlife sites adjacent to Hellenic airports, with significant avifauna activities recorded. Data have been extracted from the NATURA 2000 Network Database and combined with other available references*

SITE NAME and NATURA 2000 code	AREA Ha	Adjacent Airport	Conservation status*	Short Description	Avifauna	Number of species
DELTA EVROU (GR1110001)	9267	Alexandroupolis	10, 13, 16,17,19,20	Delta, lagoons, dunes, reeds, marshes, riparian woods	Raptors, breeding-wintering-migrating waterfowl	203
DELTA NESTOU & LIMNOTHALASSES KERAMOTIS (GR1150010)	21857	Kavala (Chrysoupolis)	10,16,17,19,20	Delta, lagoons, dunes, riparian woods, islets	Raptors, breeding-wintering-migrating waterfowl, seafowl, passerines	195
DELTA AXIOU-LOUDIA-ALIAKMONA (GR1220002)	11808	Thessaloniki	10, 13, 16,17,19,20	Delta, lagoons	Raptors, breeding-wintering-migrating waterfowl	177
LIMNOTHALASSA ANGELOCHORIOU (GR1220005)	800	Thessaloniki	10,17	Lagoons, sandy shore	Breeding-migrating waterfowl	141
LIMNI KASTORIAS (GR1320001)	4700	Kastoria	10,17	Lake, reeds, marshes, riparian woods	Raptors, breeding-wintering waterfowl	118
AMVRAKIKOS KOLPOS, DELTA LOUROU KAI ARACHTHOU (GR2110001)	50637	Preveza (Aktion)	10,13, 16,17,19,20	Delta, lagoons, reeds, riparian woods, hills	Raptors, breeding-wintering-migrating waterfowl, passerines	384
LIMNES VOULKARIA KAI SALTINI (GR2310006)	3223	Preveza (Aktion)	10	Lagoons, lakes, rivers, woodlands	Raptors, breeding-wintering-migrating waterfowl, seafowl	21
LIMNOTHALASSA KALOGRIAS, DASOS STROFILIAS KAI ELOS (GR2320001)	7093	Araxos	10, 13, 16,17,19	Lagoon, dunes, marshes, reeds, woodland	Raptors, breeding-migrating waterfowl	169
LIMNOTHALASSA KOTYCHI (GR2330006)	6302	Andravida	10, 13, 16,17,19,20	Lagoon, dunes	Breeding-wintering-migrating waterfowl	141
OROS PARNITHA (GR3000001)	14950	Tatoi	10, 13, 15,19	Woodland, mountain, ravines	Raptors, passerines	55
LIMNOS: CHORTAROLIMNI - LIMNI ALYKI (GR4110001)	18000	Limnos	10	Lagoons, lakes, marshes	Breeding-migrating waterfowl	24
LESVOS: KOLPOS GERAS, ELOS NTIPI KAI OROS OLYMPOS (GR4110005)	8500	Mitilini	10	Lagoons, rivers, sandy shores, marshes, woodland	Breeding-migrating waterfowl	4
KASOS KAI KASONISIA (GR4210001)	15700	Kasos	10	Rocky shores, hills, ravines	Raptors, seafowl	13
KOS: AKROTIRIO LOUROS - LIMNI PSALIDI - OROS DIKAIOS (GR4210008)	9500	Kos	10,17	Lake, hills, woodland, marshes	Raptors, seafowl, passerines	19
DIKTI: OROPEDIO LASITHIOU, KATHARO, SELENA, KRASI, SELEKANOS (GR4320002)	32050	Kastelli (Irakliou)	10	Woodland, mountain	Raptors	22

\* Numbers correspond to the respective reference column of Table 1

**Map 1.** Hellenic Airports and Airfields



**Map 2.** *Relative civil aviation traffic of the Hellenic Airports during 1999-2000*



**Map 3.** *Wildlife Sites in the vicinity of Airports*



