The present publication provides the first inventory of Important Bird Areas for seabirds (marine IBAs) in Greece and comprises one of the main results of the LIFE-Nature project "Concrete conservation actions for the Mediterranean Shag and Audouin’s Gull in Greece, including the inventory of relevant marine IBAs" (LIFE07 NAT/GR/000285). The project was implemented by the Hellenic Ornithological Society in collaboration with the Hellenic Society for the Study and Protection of the Monk Seal (MOM), the Hellenic Centre for Marine Research, the Technological Educational Institution of the Ionian Islands and the Portuguese Society for the Study of Birds (SPEA/BirdLife Portugal), with the financial support of the European Commission and the co-financing of the A.G. Leventis Foundation.

The complete identification process is described, leading to the designation of 41 marine IBAs in Greece, with the ultimate goal to promote and contribute to the conservation of seabirds and their habitats in Greece. This book also summarizes the knowledge acquired by the Hellenic Ornithological Society during the past two decades of continuous study of seabirds in the Aegean and Ionian Sea.

www.ornithologiki.gr/en/seabirds
The Hellenic Ornithological Society

The Hellenic Ornithological Society is a non governmental conservation organisation focusing on the study and protection of wild birds and their habitats, as integral elements of Greek Nature.

Since 1982 we strive to safeguard a sustainable environment where birds and people may live in harmony. We study and protect wild birds, work towards the conservation of Important Bird Areas in Greece, raise public awareness, enhance environmental education, as well as advocate and intervene in environmental policy.

The Hellenic Ornithological Society is a partner of BirdLife International, the largest global partnership for the conservation of wild birds and their habitats. HOS has been participating in BirdLife’s IBA programme for more than 20 years. The present edition is the contribution of Greece to the global effort for international seabird conservation through the designation of marine IBAs (visit the Marine e-atlas on www.birdlife.org/datazone/marine).

www.ornithologiki.gr
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Taking into account that Greece has over 15,000 kilometers of shoreline and more than 2,500 islands and islets, it is easy to understand why the marine and island environment is the key pillar of the country’s biodiversity. For decades, however, our knowledge about the marine environments, and of the birds that live there and depend on it, was quite limited particularly compared to that on the mainland, primarily due to understandable practical difficulties. Thus, concerning bird species, while the assessment and delineation of the terrestrial Important Bird Areas (IBA) started more than 25 years ago, there was not enough information for the respective marine areas, as it was based only on sporadic data and estimations.

The Hellenic Ornithological Society recognised this lack of knowledge as well as the significance of the Greek seas for the birds, and has thus been systematically surveying and monitoring bird species in the in the archipelagos of the Aegean and Ionian Sea for the last almost 20 years. Increasing reliable data concerning the distribution of seabirds, their nesting and feeding sites, as well as their seasonal movements, have been gradually collected within the framework of several LIFE projects and with the aid of new technologies and methods. The ultimate achievement and milestone of this long-lasting effort is the identification of the marine Important Bird Areas (marine IBAs) for seabirds, which best crowns/puts the best finishing touch to the completion of the LIFE-project “Concrete conservation actions for the Mediterranean Shag and the Audouin’s Gull in Greece, including the inventory of Relevant marine IBAs”.

Scientific validation of the marine IBAs in Greece goes beyond the mere identification of the most important habitats for seabirds: it is actually a step towards the protection for all wildlife that depends on the marine and island environment. The threatened marine mammals, the rare endemic flora and the dozens of reptiles and invertebrates of the islets of the Greek seas consist inseparable part of a marvelous ecosystem, which is an invaluable centerpiece of our natural heritage. This centerpiece, now more than ever, demands institutional consolidation and appropriate management, especially considering the increasing human activity and pressure that pose a threat even to these last untouched parts of the Greek nature.

The present book compiles the knowledge that HOS has gathered during its surveys and research in the Greek seas, and presents the most important sites for seabirds in them. It goes without saying that the delineation of marine IBAs is an invaluable complement for the national environmental policy and the key for the harmonization between the latter and all economic activities related to the marine environment (e.g. tourism, fishing and shipping). This, in fact, is the aim of this book: on one hand, the identification and protection these hotspots of biodiversity and on the other hand, the adjustment, now and in the future, of human activities and their inevitable impacts on wildlife, in the interest of both sides.

Apostolos Kaltsis
President of the Board
Hellenic Ornithological Society
I've always felt in love with maps. Maps of all kinds, from the very simple drawings we can do on a restaurant napkin to the very detailed satellite-based Internet ones. Maps represent our past and our history, our present and our surroundings, but they are also essential to move forward, to discover unexplored regions, to define our next challenges.

We could think that putting the most important areas for seabirds in Greece onto a map would be simple. In the end, the Aegean and Ionian Seas are probably some of the best known maritime regions in the world. Over centuries, many civilizations have sailed over this part of the Mediterranean in their pursuit of commerce, power, food and adventure… So we could guess the picture should have been clear… Well, not really.

Seabirds are amazing, fragile creatures; they survive the roughest storms, and travel thousands of kilometres in their search for food or wintering areas. Understanding how, when and where they do travel is probably one of the last remaining challenges of marine ornithology. It is not enough to know how a single bird moves out there, we need to understand how an entire colony of a particular species moves, and that means adults, juveniles, breeders and non-breeders. And we have to do it by sampling a relatively small part of the colony, as the technological, logistical and even financial limitations are very important.

HOS stood up for this challenge from the very beginning, supported by hundreds of volunteers, naturalists and fellow researchers; they have proved once again that BirdLife, and their national partners, always deliver on time and with the highest quality. This book is bound to be a major reference, both to the general public and government officials. It sets out the priorities for marine conservation, legal protection and management, and should be seen as a major guide towards achieving full protection of all seabirds using Greek waters. On behalf of BirdLife International I must congratulate the authors of this book, as well as the many volunteers and professionals that helped gathering and analysing all the necessary data. Well done my dear friends!

Now that the book is out, now the maps are ready and we can all see that several seabird species use these waters, it is time to act. BirdLife, represented by HOS in Greece, has delivered the first Greek inventory of marine IBAs. We will now lobby for their legal protection under the various European and national laws, a responsibility that lies within the Greek Government. We will be watching closely.

Ivan Ramirez
European Marine Coordinator
BirdLife International
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This publication is the result of over 15 years of team work and effort for the conservation of seabirds and the marine and coastal environment of Greece. This huge venture was achieved through countless hours in the field, covering thousands of miles at sea with every type of vessel available and reaching the most remote uninhabited islets.

This task would not have been possible without the financial support of the European Commission through the LIFE programme and the continued trust and generosity of Anastasis Leventis and the A.G. Leventis Foundation who co-funded the current LIFE-Nature project, but also many other projects implemented by the Hellenic Ornithological Society (HOS) in the Aegean and Ionian Seas, re-enforcing our will to continue our efforts for the study and conservation of seabirds.

We would like to thank Georgia Valaoras of the Astrale LIFE Monitoring Team, as well as Muriel Drukman and Paraskevi Tsurououaki of the European Commission’s LIFE unit who travelled with us though the “rough seas” of the current LIFE-Nature project. Our project partners, the Hellenic Society for the Study and Protection of the Monk Seal (MOm), the Hellenic Centre for Marine Research (HCMR), the Technological Educational Institution (TEI) of Ionian Islands and the Portuguese Society for the Study of Birds (SPEA/ BirdLife Portugal) have contributed in the success of the project through smooth and productive cooperation. We would also like to thank Tasos Dimalexis in his initiative and guidance which led to this publication.

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Once again, the contribution and support of experienced ornithologists and collaborators of the Hellenic Ornithological Society who participated in the various projects over the years and of the numerous bird watchers and members who generously offered their personal data, scientific information, photographs and time, has been invaluable. In hope that this momentum will be continued in the years ahead, we would like to gratefully acknowledge the following people for their...
We thank them all.

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The publication layout would not have been the same without the beautiful photographs generously provided by numerous shipping companies: ATTICA GROUP, ANEK Lines, Minoan Lines and LANE Sea Lines.


Also we would like to mention the positive and generous contribution of the following organizations and institutions: ATTICA GROUP, ANEK Lines, Minoan Lines and LANE Sea Lines.

The publication layout would not have been the same without the beautiful photographs generously provided by numerous photographers mentioned in Appendix 10.8. Sandra Hatzopoulou and Varvara Sioumula contributed to the graphic design. We thank them all.
Seabird conservation and IBA programme

Seabirds comprise an indispensible part of the marine and coastal environment, however, their conservation status is rapidly deteriorating. The Important Bird Areas (IBA) Programme is a worldwide initiative of BirdLife International which aims to identify, monitor and protect a global network of sites vital for the survival and conservation of bird populations. The identification of key sites for seabirds in the marine environment, i.e. marine IBAs, is a vital step in this direction. In Greece, this task has been undertaken by the Hellenic Ornithological Society (HOS) in cooperation with BirdLife International, other BirdLife partners in Europe, as well as national environmental, research and academic institutions and organizations. Chapter 1 develops the ultimate goal of the marine IBA inventory process, which is to promote the conservation of the marine environment and its biodiversity and to contribute to the marine Natura 2000 network in Greece.

Study area

The marine IBA identification process focused specifically on the marine areas under the direct jurisdiction of the Greek state, i.e. within national territorial waters, which extend up to 6 nautical miles from the coastline in the Aegean and Ionian Sea. This extensive marine and coastal area exhibits unique geographic, oceanographic and meteorological characteristics which influence the abundance and distribution of seabirds in the country (Chapter 2).

Seabirds in Greece

Despite of the high variety of coastal and marine habitats of Greece, seabird abundance and diversity are lower than expected. Among 39 species of seabirds and waterbirds recorded in Greek waters, there are six which are considered purely seabird species in the Greek context. These are one cormorant species, the Mediterranean Shag, three species of the order Procellariiformes, the Cory’s Shearwater, Yelkouan Shearwater and European Storm-petrel and two gull species, the Audouin’s Gull and Yellow-legged Gull. Useful information on the phenology, population distribution and behaviour of these species are presented in Chapter 3. Data from all above-mentioned species, apart from the Yellow-legged Gull, have been used in the definition of the current marine IBA inventory.

Marine IBAs

Marine IBAs are selected using the same IBA criteria as those applied to IBAs in the terrestrial or freshwater environment. Four different types of marine IBAs have been recognised based on the seabird distribution patterns occurring in each site: seaward extensions to breeding colonies, non-breeding (coastal) concentrations, migratory bottlenecks and areas for pelagic species (Chapter 4).

Human Activities

The insular and marine environment of Greece has been influenced by man for millennia, however during recent decades human pressure has escalated dramatically. Seabirds face various threats at sea caused by the main human activities occurring there: fisheries, aquaculture, marine traffic, tourism development, marine industrial activities, coastal development and the recently expanding sector of renewable energy. The general description of each of these types of human activities within the Greek context, the threats arising from them which affect seabirds, as well as management actions to reduce their impacts are provided in Chapter 5.

Methods

Marine IBAs have been selected on the basis of a standardised identification protocol which has been developed by BirdLife International and is explained in detail in Chapter 6. The process included (1) data collection using direct seabird records from land and at-sea, tracking of individual birds and collection of oceanographic and other marine biological data, (2) data analysis, including the statistical and geographical analysis of collected data in association with statistical modelling in order to identify and delineate candidate
sites to be included in the marine IBA inventory, (3) application of IBA criteria to identified candidate sites to verify and justify or reject their inclusion in the marine IBA inventory and (4) final delineation of boundaries and identification of the marine IBAs.

**Marine IBA inventory**

All sites that have been included in the present marine IBA inventory are described in detail. For each site, information on the geographical features, seabird populations and human activities occurring are given while threats for seabirds arising from these are discussed. Although each site is treated as a separate entity, they must also be considered as constituent parts of an integrated network of marine and terrestrial areas, which are vital for the seabird species addressed on a national, Mediterranean and global level. Information is therefore also provided on the role of separate sites for each species and their inter-relation on the regional scale.

**Conclusions**

The present marine IBA inventory consists of 41 marine areas for the Mediterranean Shag, Audouin’s Gull, Yelkouan Shearwater, Cory’s Shearwater and European Storm-petrel, covering a total area of 9,943 km² which is equivalent to approximately 8.7% of the territorial waters of Greece. These sites consist of all four types of marine IBAs, with the majority being colony seaward extensions, while the remaining include areas for pelagic species, migratory bottlenecks and non-breeding (coastal) concentrations. Their size varies between 9.4 km² and 1,866 km². The majority, 37 sites, is located in the Aegean Sea, while the remaining four in the Ionian Sea. The marine IBA identification process in Greece, however, is not yet complete. There are still several pelagic areas important for shearwater species as well as coastal marine areas which host significant numbers of waterbirds, where, due to insufficient information, marine IBAs have not been delineated until now. Nevertheless, the present edition comprises the first marine IBA inventory in Greece, summarises all available information on the five main seabird species in these sites and provides a point of reference for the designation of marine Natura 2000 sites for seabirds in Greek waters and their future management.
Mediterranean Shag
(Phalacrocorax aristotelis)
1.1 The need for seabird conservation

Seabirds comprise a vital part of the marine and coastal biodiversity of Greece, as well as of its natural heritage. Since ancient times they have been an indispensable element of human culture and a source of inspiration in mythology, art and poetry. In addition, they have also provided companionship to fishermen and seafarers and in times of need even complemented the diet of coastal communities.

Being extremely mobile, seabirds spend much of their life at sea, travelling hundreds and even thousands of kilometres, disregarding all boundaries. The patterns of distribution and behaviour vary between different species; shearwaters and storm-petrels are mainly pelagic only returning on land to breed, while other species such as cormorants and most gulls and terns are more coastal.

The populations of many species of this amazing group are now declining faster than any other bird taxon, facing a wide range of threats, both on their terrestrial breeding sites but also out at sea (Figure 1.1). Although seabirds represent only 3% of the world’s bird species, over 130 seabird species (i.e. 28%) are listed as threatened in the IUCN Red List of birds (Butchart et al. 2004; BirdLife International 2012a). The trans-national distribution of seabirds and the multitude of threats they are confronted with on land and at sea urges for immediate global solutions to ensure their future survival.

Some sites are extremely important, as they either support birds that are considered globally threatened, species dependant on specific habitats, or host large concentrations of migratory or congregatory bird species, all year round or during specific seasons. Being important biodiversity indicators, bird populations can be used for the delineation of sites with significant ecological value and hence provide guidance on key policy and strategic decisions for the protection of nature (Pearson 1995; Gregory et al. 2005). Such priority sites are being identified by BirdLife International as Important Bird Areas (or IBAs) (Box 1.1). The selection and delineation of these sites has been particularly effective for the identification of biodiversity conservation priorities and for the most efficient use of limited financial resources.

**Figure 1.1** – The Red List Index (RLI) of species survival for bird species in different species groups (1988-2012). The RLI shows the proportion of species expected to remain extant in the near future without additional conservation action. Seabirds in particular have deteriorated in status faster than others (BirdLife International 2012a).
resources. Through the global BirdLife IBA network it has been shown that site protection significantly contributes to the conservation of birds and biodiversity in the terrestrial environment (Butchart et al. 2012).

**BOX 1.1 - What are IBAs?**

**Important Bird Areas or IBAs** are priority sites for the conservation of biodiversity and especially birds, often irreplaceable or vulnerable, as they may host on a regular basis significant populations of one or more endangered, endemic or congregatory species. These sites include the best or typical examples of natural or almost pristine ecosystems, which over time become refuges for these species.

IBAs have been selected in order to form, as a whole, a connective international network covering the biogeographical range of specific species and can be considered as the minimum necessary area sufficient to ensure their survival within their distribution. Therefore, the main goal of the IBA network is to secure suitable habitats for breeding, feeding, resting and overwintering of birds.

BirdLife International has set criteria for the identification of IBAs for more than 30 years. These criteria are clear, internationally agreed, scientifically credible and objective and have been successfully applied to most bird habitats, terrestrial and freshwater (see Appendix 10.1; www.birdlife.org/datazone/info/ibacriteria). Recently these criteria have been adapted for their use in marine IBA identification (see Chapter 6). IBA sites are carefully identified, based on population data collected locally by each national BirdLife partner. Each IBA should be large enough to support populations of as many as possible of the key bird species for which it was identified, but also be of a size that is feasible to manage. As for migratory species, each IBA must cover all their requirements during their presence. However, many bird species cannot be adequately protected by the IBA network and for their conservation a different approach must be followed combining protection measures within the wider environment and beyond the boundaries of protected areas.

The IBA philosophy was developed by the International Council for Bird Protection (ICBP, currently BirdLife International) in the beginning of the 1980s. Nowadays, the same concept is actively utilised by governments, NGOs, institutions and scientists all over the world, as a tool for setting priorities and effective protection. IBAs are now widely recognised by local authorities, national legislation and policies, international agreements and conventions.

The global IBA network accounts for over 11,400 sites in more than 200 countries, territories and marine zones, and covers in total more than 12,440,000 km². On the international level, up until 2012 a total of 130 national and 8 regional inventories (Europe, Middle East, Africa, Asia, Caribbean, Tropical Andes, North and South Americas and Australia) have been published. These publications are of great importance for the information of citizens, government institutions and management authorities of sites, so that necessary measures are undertaken for their protection and appropriate conservation.

**BirdLife International’s IBA Programme**

BirdLife International’s IBA Programme aims to conserve and to improve the conservation status of IBAs identified, through the combined efforts of scientists and volunteers at local, national and international level. This aim can be achieved through the accurate and reliable inventory of IBAs, the continuous monitoring of their conservation status, the implementation of management plans and actions, the implementation of suitable policies, as well as through sound national and international legislation.

Apart from the international identification criteria, the selection criteria for IBAs in Europe have incorporated all commitments deriving from Nature Directives, such as the EU Council Directive 79/409/EEC on the Conservation of Wild Birds (‘Birds Directive’) as amended by Directive 2009/147/EC, the EU Council Directive 92/43/EEC on the
conservation of natural habitats and of wild fauna and flora (‘Habitats Directive’), the Bern Convention, as well as the Barcelona Convention (see Appendix 10.5). The European Commission and the European Court of Justice have recognised the EU IBA inventories as the only reliable scientific ‘shadow list’ for identifying Special Protection Areas (SPAs) under the EU Birds Directive.

The collection and analysis of data, which are derived from IBA monitoring provide BirdLife International with the ability, not only to record changes in the status of bird populations and their ecological characteristics, but also to assist the relevant authorities in taking suitable and scientifically sound decisions regarding these sensitive sites.

**Marine IBAs**

The majority of terrestrial sites vital for the survival of seabird species have already been included in the IBA network in the past. On the contrary, until recently, only few marine areas important for seabirds at-sea were covered by the IBA network. The first marine IBAs, as they are now known (i.e. IBAs designated for seabirds in the marine environment), were coastal shallow areas, or sites in closed seas with large concentrations of seabirds, however larger coastal areas and especially offshore marine areas beyond the littoral zone had not been included. This delayed extension to the marine environment mainly occurred because of limited knowledge on seabird population sizes and distribution patterns, especially in offshore waters. In addition, the delimitation of marine IBAs in the apparently uniform marine seascape containing few obvious natural boundaries has been a particularly challenging task, especially while suitable tools were still unavailable. This gap was overcome through the methodological and technological developments (e.g. seabird tracking) which took place over the last decade, but also by upgrading seabird conservation to an urgent nature protection priority in the European Union.

Since 2004, the **BirdLife Global Seabird Programme**1 (Box 1.2) has been working with the BirdLife Partnership to identify IBAs for seabirds both on land and at-sea. Until recently many BirdLife Partners have lacked the capacity to engage in marine issues and IBA identification in the marine environment. In order to provide support and assistance to partners, BirdLife International has held a series of workshops and compiled a “Marine IBA toolkit” (BirdLife International 2010b) which recommends standardised methods and techniques to be used in the process of marine IBA identification and delimitation. The toolkit also includes guidelines on the use of a variety of data sources, such as satellite tracking data, at-sea survey data and habitat modelling.

Apart from the above, the legislative framework changed, with the legal protection of marine areas becoming a priority. In 2012, the Conference of the Parties to the Convention on Biological Diversity (CBD) set the target of protecting 10% of marine and coastal areas by 2020. Prior to this and in response to the 2012 CBD target, the European Commission decided to extend the Natura 2000 network to the marine environment through the EU’s Birds and Habitats Directives (with the designation of marine Special Protection Areas - SPAs and Special Areas of Conservation - SACs), since the scope of the two Directives extends not only to territorial waters (6-12 nautical miles), but to Members States’ Exclusive Economic Zones (12-200 n.m. from the Member State’s coast)2.

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The systematic work of BirdLife International and more than 40 of its partners towards the expansion of the IBA network in the marine environment has resulted in the identification of more than 3,000 sites worldwide3 and the publication of the first marine IBA inventories in Europe [e.g. North Sea (Skov et al. 1995), Baltic Sea (Skov et al. 2000), Portugal (Ramirez et al. 2008) and Spain (Arcos et al. 2008)]. The present edition represents the contribution of Greece to this global effort for international seabird conservation.

The IBA Programme in Greece

In Greece the IBA programme was launched by the Hellenic Ornithological Society (HOS) in the early 1980’s when 113 IBAs were identified. Over the period 1995-2000, HOS undertook the revision of Greek IBAs resulting in the final inventory of 196 IBAs. The areas were evaluated using the criteria established by BirdLife International (see Appendix 10.1) and were presented in the publication ‘Important Bird Areas in Europe: Priority sites for conservation’ (Bourdakis and Vareltzidou 2000). Obvious gaps in the Greek IBA inventory up to that time included mountainous regions, small wetlands, migratory sites and marine areas. A total of 17 IBAs included a marine component reaching an area of 605 km², and were triggered by ‘waterbird’ and ‘seabird’ species (as defined by BirdLife International; see Chapter 3.1). Of these only 5 IBAs (159 km²) were designated for ‘seabirds’ as defined in this publication.

Since 1995, when the first seabird surveys commenced, HOS has successfully implemented numerous projects focusing on the conservation of the insular and marine regions of the country. The first project, which enabled the study of the coastal environment of the Aegean was the LIFE-Nature project “Actions for the Conservation of Larus audouinii in Greece” during 1997-99 (LIFE96 NAT/GR/003221). Following this, census work expanded in both the Aegean and Ionian Seas with the implementation of the LIFE-Nature project “Conservation measures for Falco eleonorae in Greece” during 2004-7 (LIFE03 NAT/GR/000091).

In 2007, HOS was involved in the development of BirdLife’s marine IBAs programme during which 88 candidate marine IBAs were identified, both for the seabird breeding colonies they contained, and/or because of significant areas of marine habitat within them. These were included in the internal report produced by BirdLife International (Howgate and Lascelles 2007). In 2009, HOS produced the publication “Important Bird Areas in Greece” (Portolou et al. 2009), which comprises the updated national IBA inventory for terrestrial IBAs. In 2010, following the implementation of the project “Evaluation of 69 Important Bird Areas as Special Protection Areas” (Dimalexis et al. 2009), data for 69 IBAs were updated and subsequently their SPA designation was evaluated.

Work specifically related to the marine IBA identification process commenced in 2007 with the project “Surveys and Conservation of Seabirds in Greece”, funded by the A.G. Leventis Foundation. Within this project all major actions required for the identification of the marine IBAs were initiated, including boat-based surveys, telemetry and coastal counts of seabirds. In 2009, the current LIFE-Nature project “Concrete Conservation Actions for the Mediterranean Shag and Audouin’s Gull in Greece including the Inventory of Relevant Marine IBAs” (LIFE07 NAT/GR/000285) greatly enhanced the capacity of HOS. The project supported extensive and detailed surveys of seabirds in Greece thus allowing for the production of the current marine IBA inventory. This ambitious task was made possible by the joint effort of dedicated researchers from HOS, as well as the project’s partners, the Hellenic Society for the Study and Protection of the Monk Seal (MOm), the Hellenic Centre for Marine Research (HCMR), the Technological Educational Institution (TEI) of Ionian Islands and the Portuguese Society for the Study of Birds (SPEA / BirdLife Portugal). The project was carried out with the support of the European Commission, the A.G. Leventis Foundation, BirdLife International and its partners (particularly SEO / BirdLife Spain), the central national authorities and local communities and authorities.

Compilation of seabird data from all above-mentioned projects has led to the designation of 41 marine IBAs in December 2012, presented for the first time in this edition. Of these, 33 comprise marine extensions of existing IBAs, while 8 are new IBAs covering a total marine area of 9,943 km². The present publication aims to provide all available and up-to-date information on the newly designated marine IBAs in Greece to all interested parties. Its ultimate goal is the promotion of conservation of the marine environment and its biodiversity in Greece with special reference to seabirds, and to provide the basis for the declaration of marine SPAs by the Greek authorities.

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The study area referring to the current marine IBA inventory includes primarily the territorial waters of Greece, as well as several regions of international waters found in the Aegean and Ionian Seas, located amongst the country’s territorial marine areas. National territorial waters extend 6 nautical miles (n.m.) from the coastline or to the median line with the neighbouring countries when these are less than 12 n.m. apart. These waters are under the direct jurisdiction of the state, although uses must be in accordance with the United Nations Convention on the Law of the Sea (UNCLOS). The total surface area of the Greek territorial waters is 114,507 km² (Policy Research Corporation 2011) and their geographical limits can be set at approximately between 34.5°-41° N and 19°-30° E.

The Greek marine territory is geographically situated in the northeastern Mediterranean Sea and extends mainly in the Aegean Sea and east Ionian Sea, as well as in the northwest Levant Basin and the northern Cretan Passage located between Crete and North Africa. The Aegean Sea is situated between continental Greece and Turkey and its southern limits are defined by the islands of Kythira, Crete, Karpathos and Rhodes (IHO 1953). A series of straits between these islands connect it with the Ionian Sea and the Levantine Basin. To the northeast, the Dardanelles Straits connect the Aegean Sea with the Sea of Marmara and the Black Sea. The Ionian Sea is located west of continental Greece, bordering in the north with the Adriatic Sea.
The coastline of Greece is the second longest in Europe after Norway, stretching for 17,400 km (Policy Research Corporation 2011), which accounts for approximately one third of the total Mediterranean coastline. Of this, approximately 11,000 km of coastline are located on islands since Greece possesses the largest number of islands in the Mediterranean Sea. With more than 2,000 islands and islets, of which only 227 are inhabited (GNTO 2012), and thousands more rock formations, Greece holds a unique insular environment.

Its marine and coastal environment exhibits a variety of ecosystems and habitats, in their majority cliffs and rocky shores of igneous and calcareous origin, as well as beach and deltaic formations (SoHelME 2005). In addition, it possesses a complex morphology as a result of the geological history of the eastern Mediterranean and the recent geodynamic processes and movements which have given rise to a very irregular sea bottom, extended plateaux and few very deep, corrugated trenches (Stergiou et al. 1997). The sea bottom topography of the Aegean Sea is characterised by a relatively narrow continental shelf and three main depressions i.e. the North Aegean Trough, Chios Basin and Cretan Basin and numerous shallower platforms among them i.e. the Thermaikos, Samothraki and Cyclades (Central Aegean) Plateaux (Poulos et al. 1997; SoHelME 2005). The most prominent trench is the Hellenic Trench which extends west of the Ionian Islands and continental Greece and arches south and southeast of Crete, Karpathos and Rhodes islands (SoHelME 2005). In this trench the Mediterranean basin reaches its greatest depth at Calypso Deep southwest of Peloponnese (5,267m) (Barale 2008). The islands in the Aegean and Ionian Sea are grouped geographically and administratively into islands of the Northern and Eastern Aegean, Northern Sporades, Evoia and Skyros, islands of Argosaronikos, Cyclades, Dodecanese, Crete and Ionian Islands. The complex coastline is characterised by numerous gulfs, capes and natural harbours. The most important gulfs in the Aegean Sea include Argolikos, Erionida Sea, Saronikos, Maliakos, North and South Evvoikos Gulfs, Pagasitikos, Thermaikos, Torronaios, Siggitikos, Strymonikos, Kavala, Apokoronou, Souda, Chania, Kissamos, Mirambelou, Kalloni and Gera, while in the Ionian Sea, Lakonikos, Messiniakos, Kyparissiakos, Patraikos, Korinthiakos and Amvrakikos Gulfs (SoHelME 2005).

The area of the Aegean and Ionian Sea is strongly influenced by climatic and oceanographic phenomena. Etesians (or commonly known as Meltemia) are prevailing winds over the Aegean Sea with northerly direction. These winds are formed by a combination of high atmospheric pressure over the Balkan Peninsula and low pressure over the Eastern Mediterranean. Their frequency, intensity and duration vary among years and influenced by the sun's activity. Etesian winds blow mostly during the daytime, usually from the end of May until the end of September, reaching a peak during July and August. In addition to Etesians, the Ionian Sea is also affected by winds blowing in the Adriatic Sea, mainly
hot, humid southeasterly Sirocco winds and strong, cold, downslope northerly to east-northeasterly wind Borra winds. (Nicholas D.E. 1998; SoHelME 2005).

In general, the area of the Eastern Mediterranean receives limited precipitation. The majority of rainfall occurs during winter while summers are dry with almost no rain. Higher rainfall rates are observed in the Ionian Sea while precipitation in the Aegean region is limited due to the mountain ranges of the Hellenic Peninsula.

The circulation pattern in the Aegean and Ionian Sea is influenced by the general water circulation in the Mediterranean Basin, the seabed topography and atmospheric phenomena. The Mediterranean Sea is characterised as a concentration basin, where evaporation exceeds precipitation creating dense waters. This leads to an inflow of lighter surface water from the Atlantic Ocean and an outflow of more salty and denser water from the Mediterranean Sea. On its way towards the Levantine Basin in the east, water from the Atlantic undergoes continuous evaporation which increases its salinity and thus density. In continuation, this dense water sinks in the Eastern Mediterranean and flows back towards the Western Mediterranean and the Atlantic Ocean. Similar but smaller water exchange occurs also within the Mediterranean, i.e. between the Aegean Sea and the Black Sea. On the regional level, the circulation pattern in the Aegean and Ionian Seas is complex, due to the strong seasonal variability of the atmospheric forcing, the irregular topography (varying bathymetry and a high number of islands and straits) and the presence of different water masses that interact. As a result, a variety of dynamic features is observed, dominated by cyclonic and anticyclonic eddies. Overall, the water circulation in the Aegean Sea is characterised as cyclonic. At the North Aegean Sea brackish Black Sea Water outflows from the Dardanelles Straits flowing southwards along the coasts of the Hellenic Peninsula. The South Aegean is characterised by the presence of the warm and more saline water originating in the Levantine Basin that moves northwards along the eastern part of the Aegean Sea. At the areas where the two water masses converge, fronts of high salinity and temperature gradients are formed (Poulos et al. 1997; SoHelME 2005; Bessières et al. 2012).

Although the whole Mediterranean Sea is characterised as oligotrophic, the Aegean Sea presents a high south-to-north gradient of chlorophyll–a concentrations, mainly due to the outflow of the nutrient rich Black Sea Water and the river discharge into the Northern Aegean (rivers Evros, Nestos, Strymonas, Axios, Loudias, Aliakmonas in northern Greece and Pinios in central Greece). Of particular interest are also the upwellings of nutrient rich waters along the coast of the eastern part of the Aegean Sea, associated to the strong Etesian winds occurring during summer and the fronts created at the convergence of two water masses with different characteristics – mainly Black Sea Waters and Levantine Waters, all of which influence primary productivity and distribution of fish, as well as other marine fauna including seabirds.
3.1 Seabird species and conservation status

Although coastal and marine habitat variety in Greece is high, seabird abundance and diversity is generally lower than expected. Of the 334 species of seabirds occurring worldwide, 39 have been recorded here, of which only 12 breed, some occurring on the edge of their breeding range. Other seabird species mainly utilise the coastal wetlands in the north of Greece to feed and rest during migration or while wintering.

The list of all seabird species occurring in Greece and their conservation status is provided in Appendix 10.4. According to the Greek Red Data Book (Handrinos and Kastritis 2009), 7 seabirds are classified as Globally Threatened: the Red-breasted Merganser (Mergus merganser) is classified as ‘Critically Endangered’, the Mediterranean Gull (Larus melanocephalus) and Black Tern (Chlidonias niger) as ‘Endangered’, while the Audouin’s Gull (Larus audouinii), Slender-billed Gull (Larus genei), Gull-billed Tern (Sterna nilotica) and Sandwich Tern (Sterna sandvicensis) as ‘Vulnerable’. In addition, 18 species are included in Annex I of the Birds Directive (Appendix 10.5). No endemic species of seabird exists within the Greek territory. On an international level in the IUCN Red Data List (IUCN 2012), the Velvet Scoter (Melanitta fusca) is classified as ‘Endangered’, the Yelkouan Shearwater (Puffinus yelkouan) and Long-tailed Duck (Clangula hyemalis) are classified as ‘Vulnerable’, while the Audouin’s Gull as ‘Near Threatened’.

According to BirdLife International and the Ramsar Convention, bird species in the marine environment are separated into ‘waterbirds’ and ‘seabirds’. More specifically, ‘waterbirds’ include species with inland and/or coastal distribution, such as species of the families: Gaviidae (divers), Phalacrocoracidae (cormorants), Anatidae (ducks), and Laridae (gulls and terns). ‘Seabirds’ include all species from the families: Procellariidae (fulmars, petrels, shearwaters), Hydrobatidae (storm-petrels), Sulidae (gannets), Stercoraridae (skuas) and Alcidae (auks).

3.2 Population estimates and distribution in Greece

During the current marine IBA identification process, population estimates from five breeding seabird species have been used in criteria selection and application (see Chapter 6; Appendices 10.1 and 10.2). These are the Cory’s Shearwater (Calonectris diomedea), Yelkouan Shearwater and European Storm-petrel (Hydrobates pelagicus), Audouin’s Gull and the Mediterranean Shag (Phalacrocorax aristotelis). Additionally, the most common seabird in Greece, the Yellow-legged Gull (Larus michahellis) is also described below. In accordance with the above-mentioned species classification the former three are considered ‘seabirds’, while the latter three ‘waterbirds’. The phenology of each species can be found in Table 3.1 and Appendix 10.3, while threats relevant to each species are presented in Table 5.1.

Table 3.1: Main phenology variables of the 6 main seabird species in Greece

<table>
<thead>
<tr>
<th>Species</th>
<th>Arrival to breeding sites</th>
<th>Colonies</th>
<th>Clutch size (eggs)</th>
<th>Egg-laying period</th>
<th>Incubation period (days)</th>
<th>Chick stage (days)</th>
<th>Fledging period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cory’s Shearwater</td>
<td>mid March</td>
<td>mono-specific or mixed</td>
<td>1</td>
<td>mid May</td>
<td>52-54</td>
<td>90-100</td>
<td>early October</td>
</tr>
<tr>
<td>Yelkouan Shearwater</td>
<td>March</td>
<td>mono-specific or mixed</td>
<td>1</td>
<td>end of April to beginning of May (March till May)</td>
<td>48-52</td>
<td>60-68</td>
<td>July</td>
</tr>
<tr>
<td>European Storm-petrel</td>
<td>beginning of April</td>
<td>mono-specific</td>
<td>1</td>
<td>mainly May (mid April to beginning of July)</td>
<td>41-42</td>
<td>63-70</td>
<td>early autumn</td>
</tr>
<tr>
<td>Mediterranean Shag</td>
<td>December-January</td>
<td>mono-specific</td>
<td>1-6</td>
<td>end of January, peaking in mid-February</td>
<td>30</td>
<td>53</td>
<td>end of May</td>
</tr>
<tr>
<td>Audouin’s Gull</td>
<td>end of March to end of April</td>
<td>mono-specific</td>
<td>2-3</td>
<td>mid April</td>
<td>28-30</td>
<td>35-40</td>
<td>early July</td>
</tr>
<tr>
<td>Yellow-legged Gull</td>
<td>early March</td>
<td>mono-specific</td>
<td>2-3</td>
<td>mid March</td>
<td>28-30</td>
<td>35-40</td>
<td>early June</td>
</tr>
</tbody>
</table>
**Mediterranean Shag**

This cormorant species is a resident, widely-dispersed species in Greece mainly frequenting coastal waters. Shags breed colonially, forming small, loose (rarely dense) colonies, on cliff ledges or small caves or even under thick vegetation. Nesting sites are re-used in successive years by the same birds. They often roost in large groups.

Accomplished swimmers and foot-propelled divers, shags feed on benthic and pelagic fish in waters with depths up to 80 m which are usually located within a 20 km radius around their colony or roosting sites (Wanless et al. 1991; Velando and Friere 1999).

The Mediterranean Shag (*Phalacrocorax aristotelis desmarestii*) is the Mediterranean subspecies of the European Shag (*Phalacrocorax aristotelis*) which is endemic to the Mediterranean Basin and the Black Sea. Its global breeding population size is estimated to be smaller than 10,000 pairs (Aguilar and Fernandez 1999) with 1,300-1,450 pairs breeding in Greece. The most significant breeding colonies of the species are located in the North and Northeastern Aegean and the Sporades. The population in Greece is considered to be stable.
Gulls

Gull species belong to the order Charadriiformes. In the current marine IBA inventory, two species have been considered, namely the Audouin’s Gull and Yellow-legged Gull. Both species breed on rocky coasts, in the majority of cases on uninhabited islets, with gentle slopes and sparse vegetation, but rarely on inaccessible parts of larger inhabited islands. They form nests on the ground and usually change nesting site from one year to the next. They mainly utilise coastal marine areas for foraging, often following fishing boats. They also feed on a variety of plant and animal origin prey, such as molluscs, insects, small reptiles and amphibians. The Yellow-legged Gull also benefits from trawler and purse seine vessel discards and open rubbish dumps.
Audouin’s Gull

The Audouin’s Gull is endemic to the Mediterranean Sea and the Atlantic coast of Morocco. The global breeding population of the species is estimated at 21,300-22,300 breeding pairs (BirdLife International 2012c) with the most significant colonies occurring in Spain, Italy, Greece, Portugal, France, Cyprus, Croatia, Morocco, Tunisia, Turkey and Algeria (Criado 1997; Gallo-Orsi 2003). The European population comprises more than 90% of the global population, while 67% breeds on the two largest colonies (Chafarinas islands and the Ebro delta in Spain). The global population trend is considered stable or increasing due to the increased availability of prey from discards thrown back to sea by fisheries (mainly trawlers and purse seiners) in the western Mediterranean, especially around the delta of Ebro river (Barov and Derhé 2011).

The Greek breeding population is estimated at 350-500 breeding pairs (2010). This represents a decline of at least 28% compared to the last estimate of 700-900 breeding pairs (1998-9) (Gatzelia 1999; Portolou and Papaconstantinou 1999; Saravia-Mullin et al. 2012). In total, 28 different breeding areas have been identified in the Aegean and overall 70 islets have been used. Colonies are relatively small and sparsely-distributed (3-86 pairs). The most significant breeding colonies of the species in Greece are located in the Dodecanese, Cyclades, Northeast Aegean, Kythira and Crete. No breeding colony has been found yet in the Ionian Sea.

The Audouin’s Gulls breeding in Greece mainly overwinter along the northern and western coast of Africa. The wintering distribution and migration movements of the species in Greece are largely unknown, although recoveries from ringed birds occur from Cyprus, Crete, Malta, Lebanon, Tunisia and Spain. Wetlands in the northern coast of Africa are considered important wintering grounds of the Greek population.
Yellow-legged Gull

This species of gull is widely distributed around the southern regions of the Palaearctic, from the western part of the Black Sea across to the Mediterranean, Iberian Peninsula, and reaching the Macaronesian region. Breeding grounds are centred mainly around the Mediterranean but reach also the Black Sea, Caspian Sea, Azores and Madeira (Portugal) and the Canary islands (Spain). In Greece, the species is resident and widespread all along the coastline of mainland Greece and of the islands of the Aegean and Ionian Seas.

Wintering grounds include the coast of south-west Asia, most of the European coast up to Denmark and the coast of Africa from Western Sahara through the eastern Mediterranean (del Hoyo et al. 1996).

The European population is estimated at 310,000-580,000 pairs (probably an understimation) (BirdLife International 2004a), while in Greece, it is estimated at around 100,000 pairs (HOS, unpublished data). The population has risen sharply since the 80's mainly due to the increase in food availability and is still considered to be increasing. In Greece, the largest breeding colonies are located on uninhabited islets of the Evvoikos and Saronikos Gulfs that surround Attica, the most urbanised area in the country, although colonies occur on most Greek islets. The species also practises both inter- and intra-kleptoparasitism, and predates eggs and chicks. Foraging range can vary from a few kilometres around the breeding colony to up to 40 km or more.
Pelagic seabird species

All pelagic seabird species regularly occurring in Greece belong to the order Procellariiformes and include two shearwater and one storm-petrel species: the **Cory’s Shearwater**, **Yelkouan Shearwater** and **European Storm-petrel**. These are truly pelagic species, which spend most of their life at open sea, where they feed, sleep and mate. Being clumsy and vulnerable on land they only come ashore to breed. Colonies are formed on cliffs and rocky slopes of uninhabited remote islets and nests are located in burrows under shrub vegetation and large fallen rocks. A single egg is laid and incubation is carried out by both parents.

Procellariiformes are gregarious seabirds and often form flocks, which may reach thousands of birds in size. In late afternoon hours or at dusk and prior to entering their colonies, shearwaters form large congregations at-sea in the vicinity of their breeding islets (commonly called rafts). They exhibit a high degree of nest site- and mate-fidelity. Although silent at sea, they are highly vocally active at their colonies at night. They are competent gliders and divers, demonstrating effortless flight, covering hundreds of kilometers daily in search for food, which mainly consists of small species of pelagic crustaceans, fish, fish spawn and cephalopods, even plankton. They feed chiefly by surface-seizing, plunge-diving or even pursuit-diving. Cory’s Shearwaters are often observed feeding behind fishing vessels.
Cory’s Shearwater

Cory’s Shearwaters breed on islands and cliffs in the Mediterranean Sea and in the Eastern Atlantic, i.e. the Canary Islands, Berlengas Islands and the Azores. The global population of this species is estimated at 300,000-400,000 breeding pairs (i.e. 900,000-1,200,000 individuals) with the most important colonies found in Europe (270,000-290,000 pairs) (BirdLife International 2012c). The breeding population of the Mediterranean subspecies *Calonectris diomedea diomedea* is estimated at 142,478-222,886 pairs (Derhé 2011b).

The Greek population is estimated at 5,200-8,300 breeding pairs which represents 2-6% of the total population of the Mediterranean subspecies. The largest known colony in Greece is located at Strofades islets (GR087) where more than 25% of the national population is estimated to breed. Other large colonies occur mainly in the southern, central and eastern Aegean Sea although breeding has also been confirmed in the northern Aegean Sea. Colony size ranges from 5 to more than 1,000 pairs. Due to their high mobility and regardless of the colony distribution, large concentrations at-sea ranging from several hundred to few thousand individuals have been recorded at all major fishing grounds in the Aegean and Ionian Sea. Based on data from two monitored colonies, one in the Aegean Sea and one in the Ionian Sea, the population trend in Greece seems to be stable (Derhé 2011a).

Post-breeding dispersal occurs between mid-October and mid-November when birds pass through Gibraltar to the Atlantic Ocean, wintering off the coast of South America and South Africa. Cory’s Shearwaters from Greece winter in the East Atlantic off the coast of West Africa (Ristow et al. 2000; Karris et al. 2011) and return to the Mediterranean Sea via Gibraltar in February and March.
The Yelkouan Shearwater is an endemic species of the Mediterranean. Information on its distribution and population size is still limited. Its global population is estimated at 15,300-30,500 breeding pairs (BirdLife International 2012c) while the Greek population at 4,000-7,000 breeding pairs. Most important colonies occur in southern France, Italy, Malta, Algeria, Tunisia, Croatia, Albania, Greece, Bulgaria and possibly Turkey (Bourgeois and Vidal 2008). Few breeding sites have been so far confirmed in Greece mainly in the North, East and Central Aegean Sea, while no colony has been found in the Ionian Sea. The global population shows a decreasing trend (12-15% decline) and 10 colonies in the Mediterranean Sea have disappeared during the last 60 years. The population trend in Greece remains unknown, however reports indicate that certain colonies are in decline (Derhé 2011a).

During the non-breeding season Yelkouan Shearwaters disperse widely within the Mediterranean Sea (mainly Adriatic and Aegean Seas) and Black Sea, often congregating in large flocks. It is thought that during this period, a large part of the global population (25,000-40,000 individuals) passes through the Aegean and enters the Black Sea in order to exploit the rich fishing grounds and moult, before returning to the Mediterranean Sea from October onwards. Additionally 4,000-6,000 individuals are estimated to overwinter in the Aegean Sea.

The main foraging areas of the Yelkouan Shearwaters are rich coastal and pelagic fishing grounds in the North, Central and East Aegean Sea, while the species is less common in the South Aegean and Ionian Seas.
European Storm Petrel

The distribution of the smallest seabird species of the Western Palaearctic is limited mainly to the Northeast Atlantic Ocean and the West Mediterranean Sea, while the Aegean Sea comprises the easternmost part of its range. The global population of the species is estimated at 430,000-510,000 breeding pairs with the most significant colonies occurring in the islands of the Atlantic Ocean, Northern Europe (Denmark, United Kingdom, Ireland, Iceland, and Norway), in the islands of Britain, the Atlantic coast of Spain and the Canary Islands. The population trend is considered stable. The Mediterranean subspecies *Hydrobates pelagicus melitensis* comprises less than 5% of the overall global population (i.e. 12,000-17,500 breeding pairs) with the main colonies located in Malta, Sicily and the Balearic Islands.

The species occurs in all Greek seas mainly in spring and summer during the breeding period and the breeding population is estimated at 10-30 breeding pairs (BirdLife International 2004a), although this is thought to be an underestimation. Up to date only two colonies have been located, one in the Central Aegean Sea and another in the Cyclades. European

Storm-petrels, usually individual birds, are regularly observed in the Cyclades, Dodecanese, Central and southwest Aegean Sea and the Karpathian Sea suggesting potential existence of other breeding colonies.
Mediterranean Shag (Phalacrocorax aristotelis)
The Marine Important Bird Areas, or marine IBAs, are those IBAs that can be regarded as being marine in nature because of the seabird populations they contain and as such they are not fundamentally distinct from other IBAs that have been identified in terrestrial or freshwater environments (BirdLife International 2010b). All IBAs, including marine IBAs, are selected according to the same IBA criteria and follow the same site-based approach, where specific actions are likely to achieve greatest conservation benefits (Appendix 10.1). Marine IBAs however are distinct from other IBAs with respect to the habitats present, the types of data used to describe sites and the methods for defining their boundaries (see Chapter 6). Based on different seabird distribution patterns identified up to date, the following four types of marine IBAs can be distinguished (adopted from BirdLife International 2010b):

### Seaward extensions to breeding colonies

While many seabird breeding colonies have already been identified as IBAs, their boundaries have been, in almost all cases, confined to the land on which the colonies are located. The boundaries of these sites can, in many cases, be extended to include those parts of the marine environment which are used by the colony for feeding, maintenance behaviours and social interactions. Such extensions are limited by the foraging range, depth and/or habitat preferences of the species concerned. The seaward boundary is, as far as possible, colony and/or species-specific, based on known or estimated foraging and maintenance behaviour.

**Mediterranean Shag** *(Phalacrocorax aristotelis)*
Migratory bottlenecks
These are sites whose geographic position means that seabirds fly over or round in the course of regular migration. These sites are normally determined by topographic features, such as headlands and straits.

Non-breeding (coastal) concentrations
These include sites, usually in coastal areas, which hold feeding and moulting concentrations of waterbirds, such as divers, grebes and benthos-feeding ducks during the non-breeding season. They could also refer to coastal feeding areas for auks, shearwaters, etc.

Areas for pelagic species
These sites comprise marine areas remote from land at which pelagic seabirds regularly gather in large numbers, whether to feed or for other purposes. These areas usually coincide with specific oceanographic features, such as shelf-breaks, eddies and upwellings, and their biological productivity is invariably high. Thus these areas are very often used by other marine animals.
Man has been present in the coastal and insular regions of the Eastern Mediterranean and Greece for at least 10,000 years closely associated with and influencing both the terrestrial and marine environment. Terrestrial coastal habitats, and especially island regions, have been affected mainly by the establishment of settlements, the expansion of agriculture and livestock breeding and grazing, in combination with deforestation and wetland management. The marine environment has been exploited either as a food source or a medium for the progress of trade and communication.

During the 20th century, and particularly since the 1950’s, the Mediterranean environment underwent drastic changes on land, as well as at sea due to social and economic developments. Extensive population emigration from the islands to urban areas resulted in the degradation of terrestrial ecosystems and loss of biodiversity through the abandonment of traditional farming practices and land management systems, uncontrolled grazing, and intensification of agriculture (in larger islands). The accelerating and often unplanned development of the coastal zone, in order to accommodate thousands of tourists arriving during the summer months, had profound impacts on the landscape. In addition, the intensification of fisheries due to the huge increase in demand and the improvement of fishing technologies, led to the introduction of unsustainable and non-selective fishing practices.

Human activities affect bird populations in numerous and complex ways. Seabirds are particularly vulnerable because they depend both on the marine environment while foraging and on migration, but also on the coastal regions where they breed, roost and rest. At sea, seabirds have to face a multitude of threats, such as the accidental trapping in fishing gear (seabird bycatch), decreased prey availability from overfishing and marine pollution, to name but a few. On land, seabird colonies are becoming increasingly affected as human activities and coastal development expand on uninhabited islets and inaccessible coastal cliffs where these birds once found refuge. Disturbance by human presence and the introduction of predators, like rats and pet animals, may additionally lead to the abandonment and breeding failure of entire colonies.

In this chapter, the main human activities, which have been recorded in the marine and coastal area of the eastern Mediterranean are briefly presented, with specific reference to the Aegean and Ionian Seas. Activities have been separated in 6 principal categories, while the main threats arising from these and which specifically affect seabirds are mentioned and analyzed. Management actions and mitigation measures are proposed where relevant.
5.1 Fisheries

Fishing is one of the oldest activities in the Hellenic region with great importance for the national economy. This is especially true for a number of coastal and island communities where employment in the fisheries’ sector can reach up to 25-30% (SoHelME 2005). Marine fisheries in the Mediterranean are mainly artisanal, utilizing a huge diversity of fishing gears from shallow to deep waters and exhibiting very high fishing intensity and multi-specific catches (Tudela 2004). The unique character of Greek fisheries has been shaped by features of the marine environment, such as the extensive coastline with the abundance of small islets, the narrow continental shelf and low biological productivity but high biodiversity. The two main fishery types occurring in Greece are small-scale fisheries, using set gear (gill, trammel and surrounding nets, hooklines, longlines, traps, etc.) and towed gear such as dredges and beach seines, and medium fisheries, mainly trawlers and purse seiners.

Greece possesses the largest fishing fleet in the European Union comprising of 16,323 vessels (EU Fleet Register 2012), the vast proportion of which involves coastal fisheries. Fishing is generally confined to a narrow zone up to 3 n.m. from the coast, however coastal fisheries operate in yet a narrower zone with depths reaching up to 100 m, which in many areas does not extend beyond 1 n.m. from the coast (SoHelME 2005).

Several problems recorded in the Greek fisheries sector include old and insufficiently equipped fishing vessels with high operating costs and the increased competition for the available natural resources. Although, Greek fisheries conform with the EU Common Fishery Policy, modernization of the fishing fleet and improvements in the sustainability of the resources have not progressed sufficiently, although the fishing fleet size has been decreasing continuously over the last two decades.

Seabirds are top predators, frequently interacting with fisheries in search of food. The influence of fishing activities on seabird populations is cumulative and the effects are now considered profound (Croxall et al. 2012). The most important impacts identified, namely a) direct mortality through bycatch and b) indirect impacts from changes in prey availability, are discussed below.

**Bycatch in fishing gear**

Accidental catches (bycatch) of seabirds in fishing gear pose a serious threat to many seabird populations while also causing adverse effects on fishing productivity and profitability (EU-PoA
Bycatch in longlines and nets is one of the main causes of the global decline in many seabird species. It is estimated that as many as 160,000-320,000 seabirds are killed annually (Gilman 2001; Cooper et al. 2003; Anderson et al. 2011). Seabirds are long-lived species, exhibiting delayed maturity, low fecundity and high annual adult survival. Thus, even apparently slight changes in adult mortality, such as those caused through bycatch, if sustained can have alarming effects on the dynamics of seabird populations (Montevecchi 2002; Arcos et al. 2008). Many fishing methods exhibit low selectivity and often capture non-target fish and seabird species, especially certain types of longlines and gillnets. Evidence relating to incidental catches in trawlers and purse seine fisheries is still lacking. Species belonging to the order of Procellariiformes, such as Cory’s and Yelkouan Shearwaters in the Mediterranean Sea, are considered to be most affected by seabird bycatch as they are those most attracted by longline baits, become easily hooked on the lines and drown at very high mortality rates of 88-100% (Laneri et al. 2010). Diving species such as seaducks and cormorants are more vulnerable to entanglement in gillnets, especially since the 1960’s following the production of synthetic nets, which decreased the visibility of this gear type once in water (BirdLife International 2010a).

A recent assessment of seabird bycatch in Greece (Fric et al. 2012) has shown that all seabird species breeding in Greece, except from the European Storm-petrel are implicated in some way with bycatch in fishing gear. Bycatch occurs in all areas of the Aegean and Ionian Seas with differences in bycatch rates noted among species, seasons and types of fishing gear. The Yelkouan and Cory’s Shearwaters are the most vulnerable to bycatch in bottom longlines, as they endeavour to seize the bait while it sinks. Most shearwaters get caught during spring migration and the breeding season in spring and summer. Groups of few tens to few hundreds of Yelkouan Shearwaters also occasionally get entangled and drowned in fishing nets when diving in search for food. Audouin’s Gulls occasionally follow longlines (mainly bottom longlines) and get hooked. Mediterranean Shags seem to be the least susceptible to bycatch, getting caught by hooks or entangled in nets only occasionally and primarily in coastal waters since they exhibit low foraging dispersal (generally up to 20 km from the colonies). In general, none or only few seabirds get caught by a single fishery every year, while large bycatch incidents are rare. Such cases include the approximately 500 Yelkouan Shearwaters reported caught in a single net in the North Aegean (MOm 2008 unpublished data; ICES 2008), while >70 individuals of the same species were reported in gillnets targeting squid in spring 2012. Although annual bycatch per vessel is low, due to the large number of operating fishing vessels, it is estimated that from few hundred to several thousand seabirds may die every year in fishing gear in Greece, the vast majority of which are Yelkouan and Cory’s Shearwaters, primarily during spring migration and during the breeding season.

Additional data need to be collected on bycatch from on-board fishing vessels as well as through questionnaire-based surveys at fishing ports in the Aegean and Ionian Sea in order to establish the extent and severity of the impacts of bycatch on seabird populations in Greece. Based on the available information it is considered that the importance of this threat is medium and locally high and that mitigation measures for the reduction of bycatch should be implemented to prevent the decline of seabird populations. Several fishermen in Greece already use mitigation measures, such as avoiding large concentrations of shearwaters and setting longlines during day time, increasing longline weights, use of colourful buoys to distract birds, etc. to minimise longline bait losses caused by seabirds thus reducing bycatch rates.

Changes in prey availability

Indirect effects caused by fishing practices on the marine environment overall are also considered to be very important, mainly through the decline of fish populations and thus in the long term prey depletion. Changes in prey availability seem to mainly affect seabirds’ reproductive performance and have led to changes in the structure of seabird communities, generally favouring generalist species (Arcos et al. 2007).

Although, purse seine fisheries are considered to be relatively selective, they mainly target small pelagic fish (pelagics), such as anchovies and sardines, which comprise the primary prey of primarily pelagic seabird species. The populations of these small pelagics undergo considerable fluctuations resulting both from natural environmental factors and intense fishing practices. Various research projects assessing the state of commercial marine resources indicate high or even over-exploitation and the decline of several commercial fish species populations, including demersal and small pelagics, as well as, highly migratory species (e.g. tuna and swordfish) (SoHelME 2005). Overexploitation due to increased demand for fisheries products has led to a significant decrease in fisheries’ catches, which have more than halved since 1994 (SoHelME 2005;
Impacts of fisheries on the ecosystems vary from local effects on the seafloor caused by trawler gear to large-scale impacts to the populations of non-target species, such as non-commercial fish species, crustaceans, mollusks, algae, marine mammals and sea turtles, as well as seabirds. For many of these species, the intensity and mode of the impact has been neither quantified nor addressed in depth. Over the last few years, studies on the impacts of fisheries on seabirds has increased significantly, although more research is needed. Some evidence exists from fishing practices in the North Sea suggesting decreased seabird productivity (Frederiksen et al. 2004).

Up to date, no direct evidence exists demonstrating that increased exploitation of small pelagics in the Greek Seas has led to the decline of any specific seabird species. However, it is considered possible that local fluctuations in the abundance of fish have led to the recorded decline in the reproductive success of certain Audouin’s Gull colonies in Greece. Additionally in 2010, an intense algal bloom in the Northern Aegean caused among others, the significant decline of fish species in coastal waters. This resulted in the dramatic decline of the Mediterranean Shag’s breeding activities, the abandonment of already active nests and minimal colony productivity thus indicating strong dependence of the species on prey availability. Since this species covers considerably smaller foraging ranges compared to shearwaters, local prey depletion could have significant effects on its breeding performance.

Trawling is a less selective fishing method, producing large amounts of non-commercial discards (44% of catches) which are exploited by many surface-feeding seabird species, mainly gulls and shearwaters, providing thus an extra source of food. Although this has an initial positive effect on the populations of these seabirds, trawlers lead to significant degradation of the marine environment, specifically of the benthic communities and in the long term cause reduced prey availability for seabirds. Although the proportion of food supplied by trawler discards has not been quantified in Greece, evidence from the West Mediterranean shows that seabird populations may heavily rely on these (Louzao et al. 2006; Oro et al.1996; Arcos and Oro 2002; Tavecchia et al. 2007; Mañosa et al. 2004). A reduction in this anthropogenic food source would force seabird populations to return to their natural levels and their normal feeding strategies. In the long term, the degradation of the marine environment is expected to cause greater decline of seabird populations.
5.2 Aquaculture

Over the last few decades, aquaculture production in the Mediterranean Sea and Black Sea, especially finfish production, has exhibited an exponential increase, primarily due to technological advances (GFCM and FAO 2011). Worldwide aquaculture is expected to exceed fisheries turnover in the medium to long term in response to the soaring demand for seafood products (IUCN 2009).

Following 1981, when Greece joined the EU, the marine aquaculture sector started to evolve initially with the aid of the structural funds and expanded significantly since 1985 aided by low labour costs and the optimal prevailing conditions (high water temperature, clear oligotrophic waters, extensive coastal habitats, sheltered gulfs and coves and numerous islets). Most cultivating finfish units use floating cages under intensive and semi-intensive conditions and the majority of fish produced belong to the European Sea Bass (*Dicentrarchus labrax*) and Gilthead Seabream (*Sparus aurata*), covering 48% and 50% of the total production respectively. The number of fish farms has increased twelve fold during the period 1985-2002 (from 470,000 to 5,800,000 m³) making Greece the leading marine euryhaline finfish producer from aquaculture in Europe (SoHeIME 2005). The expansion of the aquaculture sector has resulted in several environmental and socio-economic issues, some well documented, and others less so, most however negative, thus compromising its future sustainability.

During fish farming high concentrations of nutrients (nitrogen, phosphorus, etc.), heavy metals, and associated by-products, such as medication and pesticides to control fish disease, are released into the surrounding waters, which can have undesirable impacts on the environment and biotic communities (GFCM and FAO 2011). Extreme concentrations of nutrients can lead to increased primary productivity and local eutrophication, especially when located in closed marine areas, such as in the Thermaikos Gulf in the North Aegean Sea (SoHeIME 2005), but may also cause a shift in plankton community composition, an increase in harmful algal blooms and a decline of Posidonia seagrass beds, to name a few. Recovery of marine communities has not been studied in depth. Sensitive Posidonia beds are specifically known to be adversely affected by high turbidity in the water column and reduced availability of light, which occur usually when the fish cages are sited at a distance <400 m. Aquaculture inputs may also result in the change of diet of seabirds as well as in the accumulation of pollutants present in available food items consumed, such as antibiotics or antioxidants.

The degradation of biotic communities in the region and localised pollution indirectly affect seabirds that use the marine area to feed. In addition, the operation of aquacultures also poses another potential threat to seabirds through direct mortality or entanglement in cage nets. Gulls and cormorants are those bird groups which mostly frequent fish farms and thus more often become entangled in cage nets in their endeavour to catch fish. The scale of this problem has not been recorded in detail.

A large part of aquaculture infrastructures in Greece includes the construction of storehouses, accommodation, mooring and manufacturing facilities often located in secluded rocky shores or on small uninhabited islets. This may lead to the degradation of the islet habitats, but also to the disturbance of seabird species breeding or roosting nearby, through increased human presence and boat traffic. It has been noted however that seabirds often become accustomed to such activities. In addition, the use of strong lighting during the night for security reasons, may lead to the disorientation of shearwaters on their return to their breeding colonies.

Finally, expansion of aquaculture operation, such as tuna farming, which has been recently introduced in the Mediterranean Sea, may lead to an increase in less selective fishing practices and to added pressure on small pelagic species populations. These low commercial value fish which are used as fish farm feed, comprise the main seabird prey.
5.3 Marine traffic

More than 480 ports and terminals exist in the Mediterranean Sea placing it amongst the world’s busiest areas of maritime activity (REMPEC 2008). In 2006, 13,000 merchant ships made 252,000 port calls accounting for 15% of global shipping activity by number of calls and 10% by vessel deadweight tons (REMPEC 2008). Twenty percent of ports are located in the Eastern Mediterranean Sea east of Greece and almost half of the ship movements in the Mediterranean Sea take place in Greece and Italy.

Vessel activity has been rising steadily in the Mediterranean over the past decades and is projected to rise further still mostly in the chemical, crude oil and liquefied natural gas tanker sectors and also in container vessel movements. The maritime activity is dominated by high-frequency small and medium-size intra-Mediterranean passenger traffic however, the largest volume of trade (including petroleum oils and gases) is covered by lower frequency larger vessels.

Oil pollution

The Mediterranean is both a major load and discharge centre for crude oil, with approximately 18% (421 million tonnes) of global seaborne crude oil shipments taking place within or through it. Crude oil transport has increased by more than 40% during the last decades. The major crude oil traffic lanes occurring in the Mediterranean are from the Black Sea (mainly Novorossiysk port) to Mediterranean destinations and from Sidi Kerir port in Egypt to ports within the Mediterranean as well as west of Gibraltar and the Persian Gulf via the Suez Channel (REMPEC 2008). These routes transverse the Aegean Sea mainly in a northeast to southwest direction, passing from the Dardanelles Straits through Kafireas, Elafonisos and Kythira Straits, and also in a north to south direction through the straits between Karpathos and Rhodes and finally in the Ionian Sea towards the Adriatic Sea.

Exports of crude oil from Black Sea ports averaging at over 100 million tonnes a year are expected to continue to rise since new crude oil export routes are being planned from the Caspian region, through the development of new pipelines bypassing the Bosphorus. The density of crude oil tanker deployment is expected to rise in the East Mediterranean Sea, although the greatest level of vessel activity will continue to be concentrated around West and Central Mediterranean ports (REMPEC 2008). Vessels calling at ports in the East Mediterranean Sea are significantly older than those at West and Central Mediterranean ports, thus the area is exposed to a higher risk of pollution.

Although, maritime transport is considered very efficient, accidental oil spills caused are still an important source of pollution of the world’s oceans, especially along some of the major shipping lanes. Despite growth in the oil trade, the number of recorded tanker oil spills has fallen in recent years. From 1970 till 2011 more than 5.7 million tonnes of oil have been lost to the sea as a result of major tanker accidents. Surprising as it may be however, these accidents account for only 10% of the oil lost to the environment annually (ITOPF 2012). Oil pollution occurs also when tankers discharge ballast water contained in their oil compartments, whilst all ships discharge oil-contaminated bilge water often carried within empty fuel tanks (Clark 1997). Finally, thousands of small oil spills go unrecorded during loading or discharging.

Eight medium and large oil spills have taken place in Greek waters from 1979 till today (ITOFP 2011), the last being the Eurobulker X which wrecked in 2002 while discharging 500 tonnes of fuel and diesel oil in Lefkandi, South Evvoikos Gulf.

Impacts to seabirds

Seabirds, especially those that dive into the water or swim on the surface, are very exposed to marine pollution since they spend most of their lives at sea. They are particularly susceptible to floating oil when they congregate in large numbers either during the breeding or moulting period, while their colony and roosting sites can be directly oiled by wave action. Migrating seabirds however are also at risk. The Aegean is a major migration route for tens of thousands of seabirds travelling via the Dardanelles.
and Bosporus Straits, to and from the Black Sea and Eastern Europe. Migrating species include the Yelkouan Shearwater as well as several species of gulls Laridae and terns Sternidae.

Volume of oil lost is not the only factor determining the effects on marine wildlife. Serious problems may occur from small-scale spills when these take place near sensitive areas and/or involve rare species with small or localised populations. Oil can affect seabirds in a number of ways: directly, through coating bird plumage and reducing the waterproofing and insulation properties of feathers and allowing water to seep in and soak the down often leading to hypothermia or even drowning; but also indirectly through poisoning and a variety of physiological disorders. While preening, birds can ingest toxic substances from their plumage, which can adversely affect their metabolism leading to dehydration and poisoning (Nettleship et al. 1994). In sub-lethal levels, oil ingestion will decrease productivity and survival, while on return to the nest, oil may be transferred from the bird’s plumage to its live young or eggs leading to failed hatching, abnormal embryo development and eggshell thinning (ITOPF 2005). Finally, the effects of an oil spill may be masked since mostly juvenile or immature birds are often killed, thus any population decline observed at colonies would be delayed at least a few years (Camphuysen et al. 2005).

**Other pollution**

The main chemical transport route for chemical tankers passes from Aliaga port in the western coast of Turkey to Antalya port in the southern coast, transversing through the Dodecanese islands (REMPEC 2008). The volumes of chemicals transported by sea are increasing significantly over the years. Accidents occur involving a huge variety of substances, with varying properties and behaviour once spilt, thus the effects on the marine environment are very complex and mostly undocumented (ITOPF 2005). Different aquatic organisms exhibit different tolerances to substances, while some substances persist for long periods (heavy metals and pesticides) and bioaccumulate.
5.4 Tourism development

Mass tourism appeared on many insular areas of Greece from as early on as the 1960’s. Changes that occurred during the following decades were severe, leading to extensive unplanned and unsustainable development of the coastal and marine environment. Although, the majority of tourist infrastructures refer to the coastal zone of larger islands and of mainland Greece, recently recreational activities have shifted also to the marine space, remote uninhabited islets and inaccessible rocky cliffs where seabirds have found refuge for millennia.

Tourist recreational activities in the coastal zone and marine area, such as local boat excursions to islets, amateur fishing, scuba diving, water sports, rock climbing, etc. typically take place during spring and summer, coinciding with the breeding period of most seabird species. On land, human presence close to colonies may cause disturbance to roosting and ground-nesting seabirds, flushing adults from their nests. Intense disturbance provokes stress and repeated flight responses may result in the abandonment of nests or even colonies (BirdLife International 2012d). Chicks or eggs of unattended nests may become predated or exposed to harsh weather conditions, leading to reduced breeding success. Shearwater species breed in burrows, which they attend at night and are thus less sensitive to disturbance from diurnal human presence and activities close to the their colonies. However, artificial lighting close to shearwater colonies at night may cause disorientation often leading to direct collisions and the injury of returning birds, while disturbing noises (e.g. vessel generators) may interfere with seabird vocal social interactions. Thus, the increase of recreational boats close to colonies can have a negative effect on the reproductive success and survival of seabirds (Velando and Munilla 2008). Human presence on coastal areas may also generate the accumulation of waste. This may attract predators, avian and terrestrial, which often end up preying seabird eggs, chicks and even adult birds (e.g. Cory’s Shearwater and Audouin’s Gulls). Recreational activities at sea are also known to cause disturbance impeding resting or foraging of seabirds. During afternoon and dusk they can disrupt the rafting behaviour of shearwater species prior to their entrance to their breeding colony. They also reduce foraging activity of seabirds, which may result in high mortality, especially of juvenile individuals (Velando and Munilla 2008). Shags have been shown to avoid optimal foraging areas and exhibit drastically reduced foraging activity when faced with boat disturbance (Velando and Munilla 2011). Repeated mooring activity and anchoring cause the degradation of Posidonia beds and indirectly affect the breeding success of seabirds that feed at these habitats, such as the Mediterranean Shag.

In future years, increased tourist pressure in coastal areas and the expansion of eco-tourism will create even more intense conflicts between seabirds and recreational uses. Wardening and management of tourist activities has been planned and implemented (at differing degrees) only in the 3 protected marine areas in Greece, namely the National Marine Park of Alonnisos Northern Sporades, the National Marine Park of Zakynthos and the North Karpathos-Saria protected area. Thus, in most marine areas which are important for seabirds, tourist activities are uncontrolled. Since sensitivity to human disturbance differs among species, conservation measures enforced in marine protected areas should be adjusted to the needs of the specific species and the existing human activities (Martínez-Abraín et al. 2008).
5.5 Coastal development

The coastal region of Greece has always been densely populated, while nowadays one third of the total population inhabits a relatively narrow coastal zone. Coastal development is related to numerous human activities, namely tourism, summer housing, urbanization, industry, agriculture, aquaculture and more. Human activities in the coastal area influence seabirds and the marine environment in various ways and create numerous conflicts (SoHelME 2005). This becomes even more pronounced since the peak of the tourist season coincides temporally with the breeding period of most seabird species (late spring - early summer months).

The coastal zone in Greece is public land and in this context is formally protected from uncontrolled and private development. However, laws are frequently violated and illegal development and activities are common practice leading to the degradation of the coastal habitat of Greece. In order to minimise their impacts, it is imperative to implement Integrated Coastal Management Plans on a national, regional and local level.

Overall, the greatest impacts of the coastal development have taken place through tourism-related development, as well as from the construction of summer homes along the coast. Over the last decades, the Greek tourist industry has developed rapidly ranking 17th in international arrivals in 2010, receiving 14-15 million tourists annually. Tourist activities and infrastructures in Greece are in general dispersed along the coast although several centres of mass tourism occur in specific large island complexes. Infrastructures mainly cover tourist accommodation (hotels, rooms, etc.), food and recreation (restaurants, bars, water sports, sight-seeing boat trips, beach facilities, etc.) and transportation infrastructure (coastal roads, piers, ports, etc.). In certain areas, the excessive rise in population during the summer months surpasses their carrying capacity, causing serious problems in water management and waste disposal, increased noise and light pollution and traffic.
**Chemical pollution**

Most Greek coastal areas exhibit very low nutrient concentrations, typical of oligotrophic marine environments. However, the marine environment adjacent to large industrial or urban centres receive large quantities of chemical pollution and may lead to eutrophication. The most important pathways of nutrients into coastal waters are through land-based sources, such as river discharges, agricultural runoffs, treated and untreated domestic sewage and industrial effluents. More than half of the population in Greece (> 6 million) inhabits the two major cities of Athens and Thessaloniki, while more than 80% of the industrial activities in Greece are located on the coast (fertiliser industries, wastewater treatment works, oil refineries, aquacultures, commercial harbours, olive oil processing by-products, etc.). Significant quantities of heavy metals and PCBs are introduced into the marine environment by direct discharges of industrial and domestic wastes and are those creating most concern. Coastal areas receiving large nutrient inputs include the Gulfs of Elefsina, Saronikos, Thermaikos, Kavala and Gera.

The impacts of those contaminants on seabirds is difficult to assess. Mercury is associated with a number of adverse effects such as eggshell thinning, reduced egg production, lighter eggs, smaller clutches, reduced hatching success and fledging rates (Burger 1993). Studies on eggshell and feather samples from different Audouin's Gull and Mediterranean Shag colonies in the Aegean Sea suggest that the levels of PCBs, organochlorine pesticides, as well as mercury and other heavy metals are low and do not seem to pose a toxic hazard to the their Aegean populations (Goutner et al. 2000; Goutner et al. 2001; Skotti et al. 2012).

**Ecological light pollution**

With coastal development comes the increased use of artificial lighting for infrastructures such as buildings, roads, harbours, airports and ultimately light pollution, significantly altering the natural environmental conditions. Light pollution also occurs in the marine environment and is generated by lights on fishing vessels, ships, offshore oil platforms, etc.

Ecological light pollution has been well documented to change the nocturnal activities of many animals and influence reproductive physiology, migration, foraging and breeding behaviour of many species (Longcore and Rich 2004; Raine et al. 2007; Rodrigues et al. 2012). Many seabird species are affected, including shearwaters, petrels, and some gull species. Nocturnal seabird species, such as the shearwaters, are especially sensitive to artificial lights since they attend breeding colonies at night so as to avoid predation by gulls and raptors but also because they gather in rafts around colonies, awaiting the onset of darkness before coming ashore. Artificial lights can attract and disorientate birds particularly fledglings during their first flight to sea. The inexperienced young show phototropic feeding behaviour and confuse artificial lights for migrating bioluminescent squid. Light pollution has been shown to negatively affect almost 20% of the Cory's Shearwater fledglings in the Azores colonies, mainly those in close proximity to high levels of artificial light (Rodrigues et al. 2012). Grounded birds die from starvation and exhaustion, from injuries caused by collision, or are taken by predators (e.g. higher Storm-petrel predation rates by Yellow-legged Gulls in areas of increased night lighting; Oro et al. 2005). Another issue is decreased vocalisation to avoid attracting predators, as in the case of the Balearic Shearwater (Puffinus mauretanicus), however silent colonies risk disappearing in the long term as they do not attract new recruits (Ruiz and Marti 2004).

Since most shearwater colonies in Greece are located on relatively inaccessible, uninhabited islets, seabirds are not considered to be significantly threatened by coastal artificial lighting but mostly by lights used by certain fishing practices, such as purse seiners and trawlers, but also small coastal fisheries using lamps to attract squid. Birds have been reported to get grounded upon the vessel deck, or injured by collision on the vessel sides, although the extent and significance of this issue has not been studied.

Mitigation measures should include the use of light shielding, particularly in sites that attract more birds. A study carried out in Hawaii has shown that light shields, used to avoid upward radiation, decrease the attraction of Newell's Shearwater (Puffinus newelli) by nearly 40% (Reed et al. 1985). An additional important proactive conservation measure would be the reduction of artificial light use near colonies and an explicit restriction during the peak of fledging.
5.6 Marine industrial activities

The only existing industrial activity in the Hellenic waters refers to the exploitation of fossil fuels (crude oil and natural gas) in the Gulf of Kavala. Studies for the location of fossil fuels in Greece date back to the beginning of the 20th century, while up until the 60's research was restricted to onshore sites, mainly in western Greece. Studies were undertaken by the Ministry of Industry and the Institute of Geology and Mineral Exploration (IGME) in collaboration with large international petroleum companies. Substantial deposits of oil and gas have been located in the marine area of Thasos island, the Gulf of Kavala and the marine area of Katakolo (western Peloponnese). Permits provided to companies during 1990-2000 for further studies were later withdrawn and no further research has been undertaken since. Recently exploration surveys have intensified particularly in the area of the Ionian Sea and south of Crete. It is expected that in the near future fossil fuel exploitation units will be constructed in these areas.

Offshore drilling operations create various forms of pollution that have considerable negative effects on marine and other wildlife. These include the daily disposal of drilling muds, brine wastes, deck runoff water and flowline and pipeline leaks. Spills and explosions, although less frequent also pose a threat. Drilling muds include toxic metals, such as lead chromium and mercury, as well as carcinogens, such as benzene. Produced water makes up about 20 percent of the waste associated with offshore drilling and usually has an oil content of 30 to 40 ppm. During exploratory drilling more drilling muds and water are discharged into the sea.

Apart from the pollutants, exploration for offshore oil involves firing air guns, which send a strong shock across the seabed that can decrease fish catch, damage the hearing capacity of various marine species and may lead to marine mammal strandings.

Offshore drilling also affects seabirds mainly through marine pollution, directly from oil spills or oil ingestion or secondarily through bioaccumulation of polluted prey, as described above. Offshore oil platforms may also affect seabirds, especially shearwaters, which become attracted to the lighting and flaring. Bird mortality relates either to collisions with the platform infrastructures and disorientation or to incineration by the flare (Davies et al. 1984; Rezende et al. 2002).
Table 5.1 Main threats and their importance relating to the 6 main seabird species in Greece.

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<td>Incidental bycatch in fishing gear (nets)</td>
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<td>Invasive and competitive species</td>
<td>Competition with Yellow-legged Gull</td>
<td>Lower prey availability / Lower quality nesting habitat</td>
</tr>
<tr>
<td></td>
<td>Introduction of predators (mainly rats, but also cats, dogs)</td>
<td>Egg and/or chick predation / Reduced breeding success</td>
</tr>
<tr>
<td>Renewable energy</td>
<td>Installation and operation of wind farms on islets</td>
<td>Loss of nesting habitat / Disorientation and collisions</td>
</tr>
<tr>
<td></td>
<td>Installation and operation of wind farms offshore</td>
<td>Loss of foraging habitat</td>
</tr>
<tr>
<td>Industrial activities</td>
<td>Offshore drilling operations</td>
<td>Marine pollution</td>
</tr>
<tr>
<td>(marine)</td>
<td>Offshore drilling installations</td>
<td>Disorientation and collisions</td>
</tr>
</tbody>
</table>
### Table 5.1: Main threats and their importance relating to the 6 main seabird species in Greece.

<table>
<thead>
<tr>
<th>Threat</th>
<th>Cory’s Shearwater</th>
<th>Yelkouan Shearwater</th>
<th>European Storm-petrel</th>
<th>Mediterranean Shag</th>
<th>Audouin’s Gull</th>
<th>Yellow-legged Gull</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fisheries</td>
<td>Low, locally high</td>
<td>Unknown</td>
<td>Low</td>
<td>Medium, locally high</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>Medium, locally high</td>
<td>Low</td>
<td>Medium, locally high</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>Medium, locally high</td>
<td>Unknown</td>
<td>High</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>Low</td>
<td>Unknown</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Change in prey availability</td>
<td>Medium, locally high</td>
<td>Unknown</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>Low</td>
<td>Low, potentially locally high</td>
<td>Low, potentially locally high</td>
<td>Low, potentially locally high</td>
<td>Low, potentially locally high</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Locally high</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Low, locally high</td>
<td>Unknown</td>
<td>Low</td>
<td>Low</td>
<td>Low, locally medium</td>
<td>Low, locally medium</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>Low</td>
<td>Medium, locally high</td>
<td>Low, locally high</td>
<td>Low, locally medium</td>
<td>Low, locally medium</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>Probably high</td>
<td>Medium</td>
<td>Medium</td>
<td>Unknown, probably low</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Potentially medium, locally high</td>
<td>Unknown</td>
<td>Potentially medium, locally high</td>
<td>Potentially medium, locally high</td>
<td>Potentially medium, locally high</td>
<td>Potentially medium, locally high</td>
</tr>
<tr>
<td></td>
<td>Potentially medium</td>
<td>Unknown</td>
<td>Potentially medium, locally high</td>
<td>Potentially medium, locally high</td>
<td>Potentially medium, locally high</td>
<td>Potentially medium, locally high</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>Unknown</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>Unknown</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>Unknown</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
</tbody>
</table>
5.7 Renewable energy

The European Union aims to provide 20% of consumed energy from renewable sources by 2020. In Greece the development of tidal and wave renewable energy units have not received particular interest, and the majority of renewable energy applications relate to solar and wind energy sources (RAE 2012). Conditions for the installation of offshore wind farms are considered favourable in Greece since wind intensity is predictable, large areas exhibit high wind energy potential and relatively shallow waters. Existing wind farms in insular areas are located on land, apart from one small offshore wind farm constructed in Irakleia island in the Cyclades. Up until the end of 2012, no onshore wind farms have been constructed at seabird colony sites nor inshore or offshore wind farms at major seabird foraging or migration marine areas. However a significant number of applications for offshore wind farms has been submitted to the Regulatory Authority for Energy (RAE), while large numbers of proposals are planned onshore uninhabited islets, many of which host significant seabird breeding colonies. These are reported in the description of relevant marine IBA sites including potential impacts on seabird populations.

Wind farms can negatively affect seabirds, both during the construction and operation stages. Improper siting of wind farms may lead to degradation, destruction or loss of seabird breeding habitats on land or foraging and movement habitats at sea. Wind turbines may pose barriers to migration and local foraging movements, disrupt ecological continuity and increase the risk of collision causing mortality or injuries. Additionally, they may cause habitat loss and disturbance from operating turbines, ship traffic and human presence during maintenance (Exo et al. 2003; Petersen et al. 2006). These become especially significant in areas along migratory bottlenecks and migration routes of seabirds, such as the coastal waters of the Northeast Aegean islands through which shearwaters travel on migration to the Black Sea to overwinter or during local foraging trips, as well as the Kafireas Strait.

The impacts of offshore wind farms on seabirds are usually more significant than those recorded from onshore farms on terrestrial birds since marine wind turbines are larger in height, the wind farms themselves are larger and usually birds are found in great abundance, especially when offshore wind farms are located close to breeding colonies or foraging grounds (Exo et al. 2003). Data on bird mortality is scarce, mainly due to the difficulty in recovering dead birds at sea. Existing studies have shown that collision rates are relatively low, due to avoidance which affects flying, resting and foraging behaviour of seabirds, although rates could be higher in poor visibility conditions (Desholm and Kahlert 2005). Long-term monitoring at wind farms in Denmark indicated that the majority of bird species avoided flying between the turbine rows (Desholm and Kahlert 2005; DONG Energy 2006; Petersen et al 2006). Post-construction use of the wind farm area decreased relative to the pre-construction baseline, demonstrating foraging habitat loss to wind farms.

Thus, planning of offshore wind farms should take into account avian migration routes and foraging grounds in the marine environment in order to mitigate impacts to seabirds. The EU’s Environmental Impact Assessment Directive requires assessment of the cumulative effects and impacts arising from all wind farms in the surrounding area (Exo et al. 2003). Mitigation measures from onshore schemes are also applicable to offshore wind farms.
The current marine IBA identification process focused on five priority seabird species of conservation concern in Greece, namely the Audouin’s Gull, Mediterranean Shag, Yelkouan Shearwater, Cory’s Shearwater and European Storm-petrel, all belonging to Annex I of the EU Birds Directive (see Appendix 10.3).

The protocol followed for the identification of the marine IBAs in Greece was based on the standardised protocol developed by BirdLife International in the document “Marine Important Bird Areas toolkit” (BirdLife International 2010b), as well as on the knowledge and experience of other BirdLife partners, which have already completed their marine IBA inventories, i.e. SPEA / BirdLife Portugal (Ramirez et al. 2008) and SEO / BirdLife Spain (Arcos et al. 2009). The process of identifying the marine IBAs can be summarised in four main steps:

**Step 1: Data collection**

Data were collected on seabird populations, distribution and movements, as well as on the environmental variables affecting them. This task was made possible during recent years through a series of technological and methodological developments, such as the production of telemetry devices suitable for seabird tracking and the application of standardised seabird recording methods.

Direct seabird recording methods included colony surveys, boat-based surveys, (i.e. European Seabirds At Sea - ESAS method and line transects along the coastline), coastal counts from coastal vantage points and tracking of individual birds using telemetry. In addition, oceanographic and other marine biological variables, which influence seabird distribution at-sea, were collected.

**Step 2: Data analysis and identification of candidate sites**

This step involved the statistical and geographical analysis of collected data in association with statistical modelling resulting in the identification and delineation of candidate sites for each species separately. These were then assessed for their inclusion in the list of candidate sites.

**Step 3: Application of IBA criteria on identified candidate sites**

IBA criteria were applied to each candidate site identified during the previous step in order to verify and justify or reject them as part of the final marine IBA inventory.

**Step 4: Final delineation of boundaries and identification of marine IBAs**

Overlapping candidate sites for different species which fulfilled IBA criteria were merged into single marine IBAs. Where appropriate, the boundaries were simplified in order to allow easier identification of the limits of the marine IBAs and facilitate their future use as distinct units for the conservation of seabirds at sea. The resulting marine IBA inventory includes those areas which have been recognised as the key marine sites for seabirds in Greece and has been submitted to the BirdLife International Secretariat for validation.

The steps followed in the marine IBA identification process in Greece are discussed in detail below.
6.1 Data collection

Systematic collection of data on land as well as at-sea for the delineation of marine IBAs for the above-mentioned seabird species in Greece started in 2007 with the project “Survey and Conservation of Seabirds in Greece”¹ and was greatly expanded in 2009 with the LIFE-Nature project “Concrete conservation actions for the Mediterranean Shag and Audouin’s Gull in Greece, including the inventory of relevant marine IBAs”². In addition to these marine IBA oriented projects, all available data collected by HOS during the last 15 years³,⁴,⁵ and considered relevant to marine IBAs were utilised and included.

6.1.1 Colony surveys

The main seabird breeding areas in Greece had already been identified in the early stages of seabird work while in 2000 the major colonies were included in the terrestrial IBA network (Handrinos and Akriotis 1997; Bourdakis and Vareltzidou 2000; Portolou et al. 2009). However, at the beginning of the marine IBA identification process there were still significant gaps in the breeding distribution and population size of seabirds.

The first stage within the data collection process included the compilation of existing information on the size and location of seabird colonies, particularly those that fulfilled IBA criteria during the first evaluation of Greek IBAs in 2000. These data, initially allowed for the prioritisation and identification of the main areas in the Aegean and Ionian Sea, which needed to be surveyed, and furthermore provided information on the abundance of seabirds using the marine areas adjacent to breeding colonies.

Seabird colony size estimation was carried out using various methods including direct counts and mapping of apparently occupied nests, while in the case of large shearwater colonies, sample quadrat monitoring was applied (Bibby 1992; Walsh et al. 1995; Gilbert et al. 1998). In addition, in the case of the Audouin’s Gull and the Mediterranean Shag, direct counts of breeding individuals were also used to obtain further information on their colony size. Monitoring data from specific colonies, such as predation or bycatch incidents and other breeding failure causes were used to describe threats to individual colonies in marine IBAs.

6.1.2 Marine Surveys

Marine surveys comprised the main source of information with respect to seabird distribution, abundance and behaviour at-sea and were carried out during all seasons to include breeding, non-breeding and migration periods of each seabird species. Most marine areas were surveyed repeatedly during different seasons and years to allow for further analysis of spatial and temporal variations in seabird distribution and habitat use (see Appendix 10.4).

6.1.2.1 European Seabirds At Sea (ESAS)

The largest proportion of marine areas were surveyed by a standardised boat-based method, namely the European Seabirds At Sea (ESAS), which
has been widely used in Europe since the 1980s to record seabirds and other marine fauna at-sea and is based on the methodologies outlined by Tasker et al. (1984) and Camphuysen and Garthe (2004). Using this method seabirds are recorded continuously within a 300-meter band, on one or both sides of the observation vessel, along a series of 5-minute line transects travelled by the vessel. The resulting records were expressed in density of birds per unit area (birds/km²), which is a standardised variable used for the assessment of seabird abundance at-sea.

ESAS surveys were carried out primarily along predefined routes by HOS and MOm vessels, however vessels of opportunity (e.g. ferry boats) were also extensively used. In total, a distance of 26,495 km was covered during ESAS surveys, resulting in a total surveyed area equivalent to 10,326 km² (Figure 6.1).
6.1.2.2 Line transects along the coastline

In addition to ESAS surveys, boat-based line transect surveys along the coastline of islands and the mainland have been used to record seabirds in the coastal marine areas. Line transects follow the coastline at a distance of 50-200 m from the shore and are therefore not straight lines as in the conceptually similar ESAS method (Figure 6.2). This method has been originally designed and successfully applied for recording Eleonora’s Falcon distribution in Greece (Dimalexis et al. 2007) and has been adapted for surveys of those seabird species which mainly use coastal waters, such as the Audouin’s Gull and the Mediterranean Shag. Thus, seabird data collected during the implementation of other coastal species surveys (e.g. Eleonora’s Falcon, Yellow-legged Gulls) could be used for the assessment of the distribution of the above-mentioned seabirds of conservation concern in coastal waters. As in the case of ESAS data, seabird abundance was expressed in density of

![Recording seabirds along the coastline](image)

**Figure 6.2:** Example of line transect along the coast of Agathonisi island
birds per area, thus ensuring compatibility with the estimated abundance derived from ESAS surveys.

The total coastal line transect sampling effort covered 11,106 km of coastline, equivalent to a marine area of over 3,300 km², primarily along islands in the Aegean and Ionian Sea where the largest concentrations of seabirds have been recorded (Figure 6.3).

Overall, boat-based surveys (i.e. ESAS and coastal line transects) have covered a significant proportion of the territorial waters of Greece in the Aegean and Ionian Sea (Figure 6.4). These areas include the majority of sites where seabirds of conservation concern occur in significant numbers (Figure 6.5).
Figure 6.4: Spatial coverage of marine areas in the Aegean and Ionian Sea by boat-based surveys

Figure 6.5: Mediterranean Shags recorded by boat-based surveys
6.1.2.3 Coastal counts

Coastal counts were primarily carried out to record the number of birds and the geographical extent of the area used by seabirds at migratory bottlenecks and staging areas, as well as to record the abundance and distribution of seabirds in marine areas adjacent to their breeding colonies. Records during coastal counts included the number of seabirds, their behaviour, flight direction and location or distance from the vantage points using binoculars and telescopes. Seabird abundance at migratory bottlenecks and staging areas were expressed in total number of birds using the area, while birds observed around colonies as densities. Since 2007, over 300 hours of coastal counts have been carried out from vantage points in the Northern Aegean, Western Cyclades, Dodecanese and Crete.

6.1.3 Telemetry

Seabird recording methods, described above, provide information on the overall distribution and activities of seabirds within areas of interest; however their application in order to determine the behaviour and use of the marine environment by individual seabirds is very limited, both spatially and temporally. Recent technological advancements in tracking devices, which record seabird movements and behaviour and are light enough to be mounted on them, have provided means to overcome this obstacle. Therefore, tracking of seabirds has become one of the main data collection methods for the identification of marine IBAs (BirdLife 2010b).

There is a wide range of devices available for tracking seabirds. The selection of suitable tracking devices requires special attention, taking into consideration the characteristics and behaviour of target species and the approach of each tracking method (Table 6.1).

When selecting tracking devices to be used, the characteristics of tracking methods and of particular tracking devices, as well as the small-to-medium weight and the ecology of the target seabird species

Table 6.1: Characteristics of six types of tracking devices available for tracking seabirds (adapted from BirdLife 2010).

<table>
<thead>
<tr>
<th>Tracking method</th>
<th>Accuracy</th>
<th>Weight (grams)</th>
<th>Lifespan of device</th>
<th>Data recovery</th>
<th>Logistics and constraints</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Positioning Satellite (GPS) loggers</td>
<td>High</td>
<td>Medium to heavy (&gt;=10g)</td>
<td>Low (days to weeks)</td>
<td>Device recovery necessary</td>
<td>Tagging team needs to be at site for several days / weeks.</td>
<td>Medium</td>
</tr>
<tr>
<td>Platform Terminal Transmitters (PTT)</td>
<td>Medium</td>
<td>Medium to heavy (&gt;= 9g)</td>
<td>High (solar powered devices up to years)</td>
<td>Real-time data downloaded via satellite</td>
<td>Requires renting of satellite time</td>
<td>Medium-High</td>
</tr>
<tr>
<td>Argos / GPS - PTT</td>
<td>High</td>
<td>Heavy</td>
<td>High (solar powered devices up to 1+ years)</td>
<td>Real-time data downloaded via satellite</td>
<td>Requires renting of satellite time. Few fixes stored each day.</td>
<td>High</td>
</tr>
<tr>
<td>Very High Frequency (VHF) Radio-tags</td>
<td>Medium</td>
<td>Light (&lt;1g)</td>
<td>Medium (weeks to months)</td>
<td>Real-time collection of data at site</td>
<td>Requires &gt;1 team working simultaneously to gather good quality data.</td>
<td>Low-Medium</td>
</tr>
<tr>
<td>Geolocators (GLS) - loggers</td>
<td>Low</td>
<td>Light (&lt;= 1g)</td>
<td>Medium-High (up to 3+ years)</td>
<td>Device recovery necessary</td>
<td>Data analysis complex.</td>
<td>Low-Medium</td>
</tr>
<tr>
<td>Compass loggers</td>
<td>Medium</td>
<td>Medium to Heavy (&gt;= 17g)</td>
<td>Low (days to weeks)</td>
<td>Device recovery necessary</td>
<td>Tagging team needs to be at site for several days / weeks. Data analysis complex</td>
<td>Medium</td>
</tr>
</tbody>
</table>
Radio-tracking using radio-tags was the main method for tracking individual Audouin’s Gulls and Mediterranean Shags. Radio-tags were mounted on birds trapped at their nesting sites early in the breeding season. The tagged birds were then tracked during the rest of the breeding season and post-breeding season. Individuals equipped with radio-tags were initially tracked by mobile antennas from land. However, due to low reception range at sea level, the majority of tracking was carried out from a speed-boat which followed the course of the birds, coupled by fixing of location using a handheld or boat GPS device together with visual recording of the tracked birds’ behaviour. The latter approach overcame the restrictions of standard radio-tracking, such as limited reception range, medium accuracy and limited information on seabird behaviour. It also provided the high spatial resolution required for the delineation of marine IBAs for Audouin’s Gulls and Mediterranean Shags, most of which were relatively small in size.
6.1.3.2 Data loggers

The suitability of datalogger use, including compass dataloggers and GPS dataloggers, has been tested in Greece on Audouin’s Gulls, Mediterranean Shags, Cory’s Shearwaters and Yelkouan Shearwaters; species heavy enough to carry these devices. GPS dataloggers were initially considered to be the best type of tracking device to be used for the collection of data for marine IBAs, due to their superior accuracy and potential to acquire seabird behaviour data from the recorded information. And indeed GPS dataloggers have proved to be the most suitable type of devices for tracking shearwaters. Their application on Yelkouan Shearwaters was limited due low accessibility of nests. The main disadvantage of GPS dataloggers has mainly been that tracked birds need to be recaptured in order to retrieve recorded data. This fact proved to be crucial and explained the limited success of these devices on Audouin’s Gulls and Mediterranean Shags, as in most cases tracked birds could not be retrapped. Therefore, radiotracking of the latter species with the use of speed-boats proved to be more suitable and cost effective than tracking with dataloggers (see above). On the other hand, although compass dataloggers provide the advantage of directly recording seabird behaviour, their accuracy was not sufficient for the marine environment of Greece, which is highly fragmented by dispersed islands and islets. Therefore their use was abandoned.

6.1.3.3 Geolocators

Geolocators were intended to provide additional information on the movements of Audouin’s Gulls and Cory’s Shearwaters during the breeding season, as well as during the post-breeding and migration seasons. These devices were successfully applied on Cory’s Shearwaters (Karris et al. 2011) however, due to their low spatial resolution, data acquired could not be used directly for the identification of seabird foraging areas, but solely to provide additional information on seabird movements in the wider area of the Eastern Mediterranean and beyond, to the Atlantic Ocean. Geolocators were also mounted on Audouin’s Gulls, although none of the devices were recovered both due to device loss and to failure to retrap the birds.

The data acquired by telemetry (radio-tracking, data loggers and geolocators) provided thousands of locations of tracked individuals, which were then available for further analysis. Seabird behaviour can be determined at these positions, based either on direct observations and data or inferred through speed data. These data were then analysed with kernel density estimators to reveal those marine areas with the greatest probability of seabird presence and foraging or resting hotspots.
6.1.4 Collection of oceanographic, marine biological data and analysis of seabird diet

Seabird distribution and abundance at sea depend on a variety of parameters such as their ecological characteristics and requirements, as well as the availability of seabird prey species. These parameters in turn are influenced by a series of static (e.g. bathymetry, seamounts) and dynamic environmental variables (e.g. sea temperature, salinity, fronts, primary productivity). Patterns of seabird distribution and abundance were explored through modelling, while the influence of the above-mentioned environmental variables on seabird distribution were tested through statistical analysis. Seabird distribution models also allowed for the extrapolation of seabird densities to areas which could not be surveyed, due to the large range of seabird distribution. Datasets of environmental variables, which were collected and used, together with data from boat-based surveys and telemetry used in seabird distribution modelling are provided in Table 6.3 (Figure 6.6).

Additionally, samples from Mediterranean Shag and Audouin’s Gull pellets and regurgitates were collected and analysed using conventional (otolith analysis) and molecular methods (Kasapidis et al. 2012). Prey items consisted primarily of fish species that live in shallow and coastal waters, a result consistent with the recorded distribution of these two seabird species (Fric et al. 2012). The prey species identified do not have commercial value, thus detailed information on their distribution in the Aegean and Ionian Sea were not available and could not be used in seabird distribution modelling.

Table 6.3: Environmental data collected and used for modelling of seabird distribution

<table>
<thead>
<tr>
<th>Variable</th>
<th>Spatial Resolution*</th>
<th>Temporal Resolution</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bathymetry</td>
<td>0.5'</td>
<td>-</td>
<td>GEBCO (<a href="http://www.bodc.ac.uk">www.bodc.ac.uk</a>)</td>
</tr>
<tr>
<td>Seabed slope</td>
<td>0.5'</td>
<td>-</td>
<td>Derived from GEBCO bathymetry</td>
</tr>
<tr>
<td>Distance to the coast</td>
<td>0.5'</td>
<td>-</td>
<td>Derived from coastline data (<a href="http://www.okxe.gr">www.okxe.gr</a>)</td>
</tr>
<tr>
<td>Distance to seabird colonies</td>
<td>0.5'</td>
<td>-</td>
<td>Derived from colony data (CostDistance method)</td>
</tr>
<tr>
<td>Distance to seamounts</td>
<td>0.5'</td>
<td>-</td>
<td>Derived from GEBCO bathymetry with customisation of Kitchingman and Lai approach (Morato and Pauly, 2004)</td>
</tr>
<tr>
<td>Sea Surface Temperature (SST)</td>
<td>2.5'</td>
<td>Seasonal average</td>
<td>Modis-Aqua (<a href="http://oceancolor.gsfc.nasa.gov">http://oceancolor.gsfc.nasa.gov</a>)</td>
</tr>
<tr>
<td>Chlorophyll-a density</td>
<td>2.5'</td>
<td>Seasonal average</td>
<td>Modis-Aqua (<a href="http://oceancolor.gsfc.nasa.gov">http://oceancolor.gsfc.nasa.gov</a>)</td>
</tr>
<tr>
<td>Distance to fronts</td>
<td>2.5'</td>
<td>Seasonal average</td>
<td>Derived from Modis-SST with Cayula fronts edge detection algorithm (Cayula and Cornillon 1992)</td>
</tr>
</tbody>
</table>

*1’ = 0.01665° of latitude/longitude (approx. = 1.75 km)
Figure 6.6: Environmental datasets
### 6.2 Data analysis and identification of candidate sites

Collected data were analyzed in order to produce datasets which are required for the recognition of seabird hotspots at sea, and for the identification and delineation of candidate marine IBAs for each species. Analysis of each type of candidate marine IBA (see Chapter 4) was carried out separately.

#### 6.2.1 Identification of candidate seaward extensions

Marine areas adjacent to the seabird breeding colonies are vital for feeding, maintenance and social interactions of the entire colony population. The function and size of colony seaward extensions varies among species and regions. Audouin's Gulls and Mediterranean Shags remain in the vicinity of their colony during the breeding season, therefore, seaward extensions must fulfill all ecological requirements. On the other hand, Cory's and Yelkouan Shearwaters are not restricted to the area surrounding the colony and may forage at distances of several tens or even hundreds of kilometres away. However, waters adjacent to their colonies are regularly used when creating congregations, i.e. rafts, before entering the colony at night. Such rafts may consist of up to several thousand individuals, depending on the size of the colony.

##### 6.2.1.1 Selection of candidate seaward extension sites

Seaward extensions are directly associated with colonies therefore candidate sites were identified directly from colony size (in breeding pairs). Consequently, candidate seaward extension sites where chosen as those which surround important seabird colonies and that fulfill IBA criteria (Table 6.4, see Appendices 10.1 and 102).

<table>
<thead>
<tr>
<th>Species</th>
<th>IBA criteria Categories</th>
<th>Number of IBAs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audouin's Gull</td>
<td>A, B, C</td>
<td>21</td>
</tr>
<tr>
<td>Mediterranean Shag</td>
<td>B, C</td>
<td>22</td>
</tr>
<tr>
<td>Cory's Shearwater</td>
<td>A, B, C</td>
<td>14</td>
</tr>
<tr>
<td>Yelkouan Shearwater</td>
<td>A, B, C</td>
<td>11</td>
</tr>
<tr>
<td>European Storm-petrel</td>
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</tbody>
</table>

The process of delineating the boundaries for these marine sites, however, varied among species and is described in detail below.

#### 6.2.1.2 Delineation of seaward extension boundaries for the Cory's Shearwater, Yelkouan Shearwater and European Storm-petrel

The delineation of seaward extensions for Cory’s and Yelkouan Shearwater colonies was overall a simple task. The extent within which rafts form around colonies was determined from raft locations recorded during boat-based surveys, from coastal counts and from available Cory’s Shearwater telemetry data. The majority of recorded rafts were located within a 5 km (= 2.7 nautical miles) radius around the colonies, similar to other countries in Europe and particularly the Mediterranean (BirdLife International Seabird Foraging Radii Database; Lascelles 2008; Arcos et al. 2009). Therefore, seaward extensions for those Cory’s and Yelkouan Shearwater colonies, which fulfilled IBA criteria included marine areas within a 2.7 nautical mile radius around the colony islets (Lascelles 2008; BirdLife International 2010b).

The radius of seaward extensions for the European Storm-petrel colonies could not be deduced from the few existing records of the species in Greece. Moreover, within the BirdLife International Seabird Foraging Radii Database, the foraging radius of the species in the Atlantic Ocean ranges from 8 to 500 km. Therefore, a precautionary 0.5 n.m. buffer was adopted around both known colonies of the species in Greece (see GR114 and GR153) (Arcos et al. 2009) (Figure 6.7).

#### 6.2.1.3 Delineation of seaward extension boundaries for the Audouin’s Gull and Mediterranean Shag

The marine distribution of Audouin’s Gulls and Mediterranean Shags around their colonies is more complex and varies among sites. Therefore, the extent of each seaward extension was determined for each species separately within each site, using a variety of data layers available for each site. The main data sources used for the delineation of seaward extensions were data acquired by boat-based surveys in association with available telemetry data.

**Data from boat-based surveys**

Seabird densities, expressed in number of birds per km², were derived from recorded observations (Figure 6.8). Important marine areas for seabirds were defined as those with densities higher than the average of all positive density values, while areas with the largest abundance of birds were defined as those with the highest 5% of positive densities (95th percentile of positive values).
Figure 6.7: Seaward extensions of the Cory’s and Yelkouan Shearwater colonies in the Northern Dodecanese.

Figure 6.8: Map of recorded Audouin’s Gull density in N. Dodecanese. Densities above average (>7.2 birds/km²) depicted by medium circles, while the highest 5% of densities (>19 birds/km²) by large circles, indicating potential hotspots.
**Telemetry data**

Data acquired by tracking of individual birds were analysed to provide additional information on the marine areas which are used by seabirds, particularly during the breeding season. Telemetry data were categorised into different types of seabird behaviour, namely movements, feeding, resting and rafting, and then were assessed by kernel density analysis to determine those marine areas most frequently used by tracked seabirds. Volume contours for 25%, 50% and 75% kernel densities (Arcos et al. 2012) were created for each track separately, to take into account different sampling intervals (i.e. number of locations recorded per time unit), and then merged for each species, behaviour type, year and colony separately. Fifty percent (50%) density contours indicate areas of high intensity use by seabirds (BirdLife International 2004), while 25% contours indicate those of highest probability of seabird presence (Figure 6.9).

**Predictive habitat suitability modelling**

Statistical models combined information of recorded species presence and abundance with environmental variables (see Chapter 6.1.4) in order to predict the most suitable areas for seabirds within the entire area of interest, to fill in sampling gaps and to explain the dependence of seabird distribution upon environmental variables. Maximum entropy modelling method (using MaxEnt software) was applied to datasets with a minimum of 30 records (Philips et al. 2006; Louzao et al. 2009; Thaxter et al. 2011; Pittman and Brown 2011; Arcos et al. 2012; Oppel et al. 2012). Models were built separately for each species, site and year. Area under curve (AUC) of receiver operating characteristics (ROC) plots was used to evaluate maximum entropy models. Modelling results from different years were integrated to verify the temporal stability of suitable areas (Figure 6.10).

Modelling results indicate that the distribution of Audouin’s Gulls and Mediterranean Shags within examined sites depends primarily on static environmental variables. The main variables that explain the distribution of the Audouin’s Gull at sea are ‘distance from colony’ and ‘distance from coast’ variables while for the Mediterranean Shag ‘distance from colony’ and ‘water depth’. The dependence of distribution on the ‘distance from colony’ variable stems from the fact that both Audouin’s Gulls and Mediterranean Shags normally feed in the vicinity of their colonies. Based on direct seabird observations and telemetry data their foraging radii are found to be 10-14 km and 6-17 km, respectively (Figures 6.11 and 6.12).

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**Figure 6.9:** Foraging tracks and respective kernel density contours of foraging areas for Audouin’s Gulls breeding in Leipsoi, N. Dodecanese
Figure 6.10: Maps above show habitat suitability for the Audouin’s Gull in the Northern Dodecanese during the 1998, 2010 and 2011 breeding seasons as deduced by maximum entropy modelling method. Low values (close to 0) represent low suitability, while high values (close to 1) represent optimal areas. The map on the right represents habitat quality resulting from the average modelling results for each year, ensuring inter-annual stability of high quality areas.
Figure 6.11: Cumulative proportion of the total number of Mediterranean Shags recorded during boat-based surveys at sea versus distance from the nearest colony in the marine area around Kavala and Thasos, North Aegean. To ensure the consistency of records the entire area was surveyed during a single survey. The Mediterranean Shags fed in waters surrounding their colonies, with 50%, 75% and 95% of recorded individuals recorded within 8.3 km, 10.3 km and 13.0 km, respectively.

Figure 6.12: Proportion of Audouin's Gull foraging locations recorded by telemetry as a function of distance from the colony on Leipsi, Northern Dodecanese.
Additionally, data collected through direct observations and telemetry show that Audouin’s Gulls in Greece usually feed at distances up to 0.5 nautical miles from the coast, while Mediterranean Shags in waters with depths up to 60 m.

**Integration of data layers and delineation of candidate seaward extensions**

All available data layers, including maps of higher than average seabird densities, 50% kernel density contours, coastal counts, as well as areas exhibiting good and optimal conditions deduced by modelling, were overlaid separately for each species, site and season. The boundaries of candidate marine seaward extensions were delineated in such a way as to enclose the overlapping areas of all above-mentioned layers, which ultimately identify the most suitable habitats for seabirds (Figure 6.13). The delineation was based primarily on datasets, which have been deduced from directly recorded data (i.e. seabird density maps and telemetry kernel density contours), while habitat suitability models and kernel density contours with fewer than 5 tracks per year were used as supplementary datasets, supporting boundary delineation. The largest concentrations of birds were usually recorded in the vicinity of colonies, rather than far from them, therefore the boundaries were additionally verified by applying the condition that at least 75% of all individuals recorded during surveys in the entire area of the candidate seaward extension should be within its boundaries (see Figure 6.11).

**Simplification of seaward extension boundaries**

Boundaries of seaward extensions, which have been derived from overlaid seabird distribution datasets may be complicated and difficult to interpret and thereby impractical, particularly in the case of the highly diverse environment of the Aegean and Ionian Sea (e.g. Figure 6.13). Therefore, where possible, characteristics of the marine distribution of species, such as the occurrence of Audouin’s Gulls and Mediterranean Shags mainly in coastal waters, were taken into account to simplify the seaward extension boundaries. Seaward extensions were represented as buffers along the coastline with constant 0.5 n.m. distance intervals from the coast (i.e. 0.5 n.m., 1 n.m., 1.5 n.m. etc). The width of each buffer was determined so as to best fit the boundaries delineated by the integration of other available data layers. In certain cases the buffer width applied is not the same within the entire site but differs along different sections of the coastline (e.g. Limnos IBA GR131; Figure 6.14).

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**Figure 6.13:** Boundary of the Audouin’s Gull seaward extensions in the Northern Dodecanese, delineated by polygon.
Another feature typical of Audouin’s Gulls and Mediterranean Shags which has contributed to boundary delineation is related to their flight behaviour. These two species generally use coastal waters for feeding and maintenance, however when flying between different areas of interest (e.g. from the colony to foraging areas), they fly in more or less a straight line and may cross areas of open sea or bays, far from the coast (e.g. Figure 6.9). These areas which are regularly used for movements should also be included within seaward extensions. Geographically this is achieved by creating convex hull polygons around the coastal buffers of seaward extensions of each seabird colony (Figure 6.15). The final area of the seaward extension results by merging all convex hull polygons within the same area. This way the boundaries of the seaward extension can be more easily described and identified in practice (Figure 6.15).

**Figure 6.14**: The width of the buffer delineating the seaward extension along the coast of Limnos (IBA GR131) is 0.5 n.m. along the northern and western coast and 1.0 n.m. along the southern coast.

**Figure 6.15**: Half nautical mile buffer along the coast of the Northern Dodecanese islands located within the Audouin’s Gull seaward extension, surrounded by a convex hull.
6.2.2 Identification of candidate areas for pelagic species

Pelagic species, such as the Cory’s and Yelkouan Shearwater and European Storm-petrel spend most of their life at sea and visit land only for nesting. Therefore, they extensively use marine areas which are far from land and from their colonies. Certain pelagic areas are of particular importance as they regularly host high densities of these seabird species. These areas usually attract pelagic seabirds due to higher food availability, which may be associated with specific oceanographic features, such as presence of seamounts or high primary productivity. The identification of candidate pelagic IBAs for these species is a more demanding task than that of colony seaward extensions, since these areas may not be associated with particular colonies. Thus, estimation of the number of seabirds using the area proves to be more complicated and usually not limited by particular geographical features.

The assessment of potentially important pelagic areas was carried out for the two main pelagic seabird species in Greece, the Cory’s and the Yelkouan Shearwaters. At-sea records of the European Storm-petrel in Greece are scarce thus this species was excluded from further analysis.

6.2.2.1 Selection of candidate pelagic areas

Data acquired by boat-based surveys was the main dataset used to select candidate pelagic areas for seabirds. Candidate sites were selected among those sites where the largest densities of pelagic seabird species have been recorded. These were identified by the highest 5% of seabird densities, i.e. corresponding to the 95th percentile of all positive records. The resulting threshold density values identifying the highest recorded densities of the Cory’s and Yelkouan Shearwaters are 23 birds/km² and 64 birds/km², respectively. Furthermore, the importance of these areas was verified by data showing regular occurrence of seabirds with densities greater than average over all seabird records, i.e. corresponding to densities higher than 8 birds/km² and 16 birds/km² for the Cory’s and Yelkouan Shearwater, respectively (Figure 6.16).

![Figure 6.16: Distribution of Cory’s Shearwater as recorded by boat-based surveys in the North Aegean Sea. Densities above average (>8 birds/km²) depicted by medium circles, while the highest 5% of densities (>23 birds/km²) by large circles, indicating potential hotspots.](image-url)
6.2.2.2. Delineation of boundaries of candidate pelagic areas

The delineation of the boundaries of the candidate pelagic areas for Cory’s and Yelkouan Shearwaters followed similar steps as the delineation of seaward extensions for the Audouin’s Gull and the Mediterranean Shag. The primary dataset used for the delineation of boundaries included higher than average seabird densities derived from boat-based observations, supported by habitat suitability models. Due to the limited number of Cory’s Shearwater individuals tracked by devices at single colonies (<20), 50% kernel density contours were not used as a separate layer but rather as a supporting layer to the boundaries of candidate pelagic areas. Habitat suitability modelling was used for Cory’s and Yelkouan Shearwater distributions, similar to that applied for Audouin’s Gulls and Mediterranean Shags for the delineation of seaward extensions (see Chapter 6.2.1.3). Where sufficiently large samples were available, separate models were built for each species, site, year and season (breeding / non-breeding), so as to estimate seasonal stability and to identify suitable and optimal habitats. Based on the above, the boundaries of each candidate pelagic area were determined (Arcos et al. 2012) by overlaying all available data layers.

6.2.2.3 Estimation of seabird numbers in pelagic areas

The estimation of seabird numbers regularly utilizing these candidate pelagic areas is essential for the application of IBA criteria. Unlike colony seaward extensions where the number of birds in the marine areas can be deduced from the size of colonies, the number of seabirds utilising candidate pelagic areas was determined by averaging all density values (i.e. zero and positive values) recorded within the area per species and ecological season (i.e. breeding, non-breeding, migration seasons) (BirdLife International 2010b). Two-sided confidence intervals, determined by bootstrapping, were used to establish the minimum and maximum estimates of the population size (BirdLife International 2010; Arcos et al. 2012).

6.2.3 Migratory bottlenecks

The Aegean and Ionian Seas are located at a junction between the Central Mediterranean, the Eastern Mediterranean Sea and the Black Sea. All seabirds, and particularly pelagic seabird species, are highly mobile and use marine areas for local foraging movements or on migration. Complex features of island and mainland geography create natural straits and bottlenecks which compel seabirds to concentrate in large numbers along their flyways.
The importance of the Greek marine areas is not only restricted to breeding and resident populations of seabirds but is also related to the migrating Yelkouan Shearwater population. It has been estimated that a large proportion of the species’ global population passes through the Aegean Sea during migration, on their way between breeding areas in the Mediterranean Sea and wintering areas in the Black Sea.

Several bottlenecks have been identified in Greece, particularly where Yelkouan and/or Cory’s Shearwaters concentrate in high numbers due to the topography of the sites. These sites are used either on migration or for foraging trips during the breeding season. The number of birds of each species using the migratory bottlenecks has been estimated from direct counts and has not been extrapolated to periods of the day that were not sampled or to the entire migration period. Therefore the estimates are considered to represent a lower limit value and the actual number of birds using these areas is expected to be higher. The extent of the sites has been estimated by coastal counts and boat-based surveys.

6.3 Application of IBA criteria to candidate IBA sites

After identifying candidate IBA sites for each species separately, IBA criteria were applied. This involved the comparison of every seabird population record to the numerical threshold values set for the specific species and criterion (Appendices 10.1 and 10.2). Species with populations exceeding these numerical thresholds and thus meeting at least one IBA criterion were considered ‘trigger species’. Candidate sites with at least one trigger species were included in the IBA inventory, while others were rejected at this stage. The final list of criteria allocated to each IBA arises from the union of all criteria met by the site’s trigger species.

Seabird population numbers in the candidate sites were estimated either from direct counts for seaward extensions and migratory bottlenecks or interpolated from the recorded densities or telemetry.
6.4 Final delineation boundaries and identification of marine IBAs

Candidate marine IBAs for each species meeting IBA criteria were merged to produce final marine IBA boundaries. Overlapping areas for different species and different types of marine IBA sites (Chapter 4) were combined to form a single marine IBA (Figure 6.19). When the resulting marine IBA was larger than that of individual trigger species, the seabird numbers present in this greater area were recalculated over the entire area of the marine IBA. The boundaries of the marine IBAs were delineated in such a way so as to allow for easy identification on-site. In marine IBAs consisting exclusively of seaward extensions for different species, these seaward extensions were merged to form a union. On the other hand, boundaries of pelagic areas and migratory bottlenecks were delimited by simple polygons which optimally enclose its constituting parts.

It should be noted that areas occupied by man-made structures, such as ports, have not been excluded by the delineation process. However, if considered necessary they should be appropriately excluded from the future corresponding SPAs for management purposes.

Candidate marine IBAs in Greece have been submitted to the BirdLife Secretariat in order to be checked and validated.
The present marine IBA inventory consists of 41 marine areas with importance for five seabird species of conservation concern, namely the Mediterranean Shag, Audouin’s Gull, Yelkouan Shearwater, Cory’s Shearwater and European Storm-petrel. The marine IBAs cover a total area of 9,943 km² which is equivalent to approximately 8.7% of the territorial waters of Greece.

The number of marine IBAs identified varies among species and regions and results from the distribution, abundance and ecology of each species in the Greek Seas. A larger number of marine IBAs (Figure 7.1) has arisen from Mediterranean Shag and Audouin’s Gull colony sites compared to those from shearwater colonies. However, several marine IBAs have been designated in regions where shearwater species occur regularly in significant numbers since these species exhibit higher mobility. Finally, only two marine IBAs have been identified for the European Storm-petrel, which is rare in Greece (Figure 7.1).

The sites also vary in the number of trigger species they host. More than half of the marine IBAs have been identified for a single trigger seabird species, while the remaining sites fulfill IBA criteria for two or more species, with two marine IBAs being important for all five priority seabird species in Greece (GR114 and GR153) (Figure 7.2). Amongst the 41 marine IBAs, ‘A’ criteria are met by 29 sites (Global; Appendix 10.1), ‘B’ criteria (European) by 26 sites and ‘C’ criteria (European Union) by 40 sites. Most of the IBAs have been selected for more than one criterion (Figure 7.3). Furthermore, 7 marine IBAs have been identified for ‘B’ criteria (but...
not for ‘A’ criteria) and 5 IBAs have been identified only for ‘C’ criteria (but not ‘A’ or ‘B’ criteria). Overall, 28 sites were selected as they host populations of globally threatened or near threatened species, i.e. Audouin’s Gull and Yelkouan Shearwater, respectively, that meet the criteria A1 and C1.

With respect to marine IBA types, the large majority of sites are seaward extensions to breeding colonies (38), seven are shearwater pelagic areas, four are sites of non-breeding (coastal) concentrations, while two are migratory bottlenecks. Several sites are characterised by more than one type of marine IBA (Figure 7.4). For the Mediterranean Shag and the Audouin’s Gull, which are primarily coastal species, the marine IBA types are mainly seaward extensions of their breeding colonies and to a lesser extent also areas of non-breeding concentrations. Marine IBAs relating to the pelagic species (i.e. Cory’s Shearwater, Yelkouan Shearwater and European Storm-petrel) include primarily colony seaward extensions and pelagic areas, as well as two migratory bottlenecks and one significant non-breeding concentrations site.

The size of the marine IBAs is highly dependent on the marine IBA type and the species they host. Their extent varies in size between 9.4 km² (GR150) and 1,866 km² (GR065) with an average area of 242 km². It should be noted that the largest three marine IBAs cover 32% of the total area of the current marine
IBA inventory. The smallest sites refer to colony seaward extensions, while the largest to pelagic areas and migratory bottlenecks (Figure 7.5).

With the conclusion of the current marine IBA inventory, sites designated for the Mediterranean Shag and Audouin’s Gull in Greece are considered to contain all major marine areas for the species. On the other hand, it should be stressed at this point, that the marine IBA inventory for the Yelkouan and Cory’s Shearwater, as well as, for the European Storm-petrel has not been completed yet. Several pelagic areas have been found to host significant numbers of these species, however the available data is still insufficient for the delineation of their marine IBA boundaries and it is considered necessary to carry out additional surveys in the future.

The current inventory of marine IBAs complements the existing Greek IBA network comprising of 196 terrestrial IBAs (Bourdakis and Vareltzidou 2000; Portolou et al. 2009). In addition to these existing IBAs, data collected over the last decade provided sufficient information for the identification of four new terrestrial sites (GR197-GR200), which fulfill IBA criteria both in their terrestrial and marine part for the seabird colonies they host. The majority of marine IBAs in the present inventory (33) are extensions of the existing terrestrial IBAs. The remaining 4 sites are of strictly marine character and could not be associated with any single terrestrial IBA and were therefore identified as entirely new IBAs (GR250-GR253). As a result of the marine IBA designation process, the complete list of IBAs in Greece presently consists of 204 IBAs, including confirmed and proposed terrestrial and marine sites.

Administratively, marine IBAs belong to 9 out of the 12 administrative regions in Greece, with the largest number being located in the administrative region of the South Aegean (Figure 7.6).

From the 41 marine IBAs, 3 fall partly or entirely within the administrative boundaries of an existing Management Body i.e. the National Marine Park of Alonnisos, Northern Sporades (GR065) and the Marine National Park of Zakynthos (GR086 and...
GR087), while a management scheme for the SPA site of Andros island is currently being established within the framework of a LIFE-Nature project (LIFE10 NAT/GR/000637).

In total, 2,913 km² in 33 marine IBAs are covered by European and national protection status (SPA and SAC designation), equivalent to 29% of the total area of the current marine IBA inventory. On the other hand, 42% of the existing marine Natura 2000 Network overlaps with the marine IBAs. The existing SPAs cover 5.8% of the marine IBAs while SACs cover 24.9%. The total area of marine IBAs which does not coincide with the current marine Natura 2000 Network amounts to 7,029 km². Overall, 21.8% of the marine IBAs overlap with the marine national parks.

With the current marine IBA inventory, key marine areas for the conservation of seabirds in Greece have been identified and delineated for the first time. In the light of continuous and increasing pressure brought about by human activities, its production is an urgent contribution and prerequisite step towards the effective conservation of the marine environment. However, legal protection and management of the marine IBAs will only be realised through the extension of the Natura 2000 Network in the marine environment and the production and implementation of management plans for these sites. Since these sites are important not only for seabirds, but also for other marine fauna and flora, including marine mammals, turtles and fish, marine ecosystems as a whole would benefit from appropriate site protection and management.

However, the marine IBA identification process in Greece has not been completed yet. Apart from the afore-mentioned gaps in the important pelagic areas for shearwaters, there are also several coastal areas which host significant numbers of waterbirds and which have not been addressed at this stage (Appendix 10.3). As in the case of shearwaters, the largest gaps in our knowledge relate mainly to the distribution of waterbird species at sea, without which delineation of relevant marine IBAs cannot be realised.

Apart from the above, among the future tasks of HOS in relation to marine IBA work in Greece, is also the promotion and assistance of the marine IBA identification process in the wider region of the Eastern Mediterranean and the Black Sea. Extensive knowledge and experience gained through the production of the current inventory and through the cooperation with other BirdLife partners that have already completed their marine IBA inventories (such as SEO / BirdLife Spain and SPEA / BirdLife Portugal), provides an ideal opportunity to support similar processes in other neighbouring countries.

Revision of the existing IBAs is a continuous process which takes place in cooperation with BirdLife International, through the evaluation of up-to-date population data, acquired through regular monitoring of IBA sites. Meanwhile, the conservation status of species is regularly revised by BirdLife International, based on international scientific information, resulting in new trigger species which often influence existing or indicate the need for new IBAs. In this aspect, all IBAs, including marine IBAs, are constantly evolving to best reflect and protect bird populations and their distributions worldwide.

**Figure 7.7:** Marine IBAs in relation to the existing marine protected areas
Site Description
This IBA, located along the eastern coast of Agio Oros peninsula encloses a 1 n.m. marine extension from Cape Arapis at the northern-most part of the peninsula up to Cape Timiou Prodromou at the eastern-most end of Mount Athos peninsula. It includes vital foraging and resting areas for the local population of the Mediterranean Shag breeding along the eastern coast of the peninsula, as well as important foraging areas for the Yelkouan Shearwaters. Significant Yelkouan Shearwater foraging areas, which are associated with rich fishing grounds of the Thracian Sea, also extend towards Thasos island and the Gulf of Kavala, beyond the current boundaries of the IBA.

Ornithological Importance
The area is of particular importance for the 20-30 pairs of Mediterranean Shag breeding along the coast and the Yelkouan shearwaters which feed in the area, primarily during the breeding season. It is estimated that up to 1,000 Yelkouan Shearwaters regularly feed within the area. Up-to-date, no large Yelkouan Shearwater colony has been discovered in the area suggesting that these birds come from colonies in the wider area of the northern and potentially central Aegean Sea. Similarly, large Yelkouan Shearwater foraging congregations have been recorded in other nearby marine areas, such as around Thasos island and Gulf of Kavala to the northeast as well as the southern and eastern coast of Sithonia peninsula to the south.

Species Table

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</table>

Co-ordinates
Co-ordinates of the marine IBA centroid (longitude, latitude / WGS84)

Area
Area of the marine IBA in km² (1 km² = 100 ha)

Region
Administrative Region in which the marine IBA is located. When a marine IBA lies in more than one Region, these are listed in a descending order with respect to the marine area included in each.

Prefecture
Prefecture in which the marine IBA is located. When a marine IBA lies in more than one Prefecture, these are listed in a descending order with respect to the marine area included in each.

Criteria
Criteria under which the site qualifies as a marine IBA (see Appendix 10.1 for criteria definitions).
### Table of estimates of seabird breeding populations

This table presents data of local breeding populations for those seabird species which meet IBA criteria in the marine IBA and relate to this or adjacent IBA(s).

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<td>2007-12</td>
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### Table of estimates of seabird numbers at sea

This table presents data of seabird populations at sea that regularly use the marine IBA and meet IBA criteria. Their presence within the marine IBA is not necessarily associated with local breeding colonies.

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### Season status

The season in which the species occurs in the marine IBA. In case a species occurs in more than one season (e.g. breeding and wintering), data are presented in separate rows.

**R** = **Resident**: a species known or thought to be present regularly all year and hence breeds during the appropriate season in the IBA.

**B** = **Breeding visitor**: a species known or thought to visit regularly during the breeding season and breed in the IBA.

**W** = **Non-breeding visitor**: a species known or thought to visit the IBA regularly during the non-breeding season.

**P** = **Passage visitor**: a species known or thought to occur regularly in the IBA during a relatively short period(s) of the year on migration between breeding and non-breeding ranges.

### Criteria

The criteria met by each trigger species within the marine IBA (see Appendices 10.1 and 10.2 for IBA criteria definitions and numerical population thresholds set for each species).

### Unit

Units in which the population was estimated:

- **P**: Breeding pairs
- **I**: Individuals
- **I***: Individuals (adults and juveniles)

### Data accuracy

Probable accuracy of data (WBDB categories):

- **A** = **Good**: based on reliable and complete or representative quantitative (survey) data
- **B** = **Medium**: based on reliable but incomplete or partially representative quantitative (survey) data
- **C** = **Poor**: based on qualitative information, but no (or potentially unreliable/unrepresentative) quantitative (survey) data
- **U** = **Unknown**

### Minimum and Maximum Population

Estimate of the minimum and maximum population size of the species at the marine IBA. Where the minimum value is well established, while the maximum value cannot be estimated, then ‘0’ is entered in the field ‘max’
Other Species of Interest
Section including information on the ornithological significance of the marine IBA for other species of interest, which do not meet IBA criteria in the site.

Uses, Threats, Management
The section presents the main human activities occurring within the IBA and the threats which arise from these for seabirds. Additionally, implemented conservation and management measures for seabird are described.

Human activities are represented by icons with colours that indicate the intensity of the activity in the site.
Marine IBA maps
The maps presented in this publication depict the boundaries of the marine IBA sites. Bathymetric contour intervals were derived from the GEBCO digital elevation model (www.bodc.ac.uk). Other characteristic information (ports, capes, gulfs, bays) are also depicted.

Legend

Important Bird Areas (IBA)
- Marine IBA boundary
- Adjacent marine IBA boundary
- Terrestrial IBA boundary

Bathymetry
- 50 m contours within marine IBA site

Bathymetric contours external to marine IBA site

Places of interest
- Populated Places (population >1000)
- Ports
8.2 Site Accounts
Site Description

The IBA includes the coastal marine area along the northeastern, eastern and southeastern coast of Samothraki island, from Cape Fonias in the north to Makrigialos Bay in the south. This area encloses a 1 n.m. marine extension along the coast of Samothraki and is used by seabirds, particularly Mediterranean Shags, for foraging and resting during the breeding, as well as the non-breeding season. The area is located in the Northeast Aegean Sea, which is highly influenced by the outflow of the Black Sea Water at the Dardanelles Strait. As a result, the area exhibits higher productivity compared to the rest of the Aegean Sea to the south which in general is oligotrophic. The Northeast Aegean Sea is one the most important fishing areas in Greece, particularly for small pelagic fish. The abundance of fish in the area attracts numerous seabirds and cetaceans. Apart from all common seabird species, three dolphin species, i.e. the Common Bottlenose Dolphin, Striped Dolphin and Short-beaked Common Dolphin, have also been recorded in the area. Additionally, the seafloor of the north part of the IBA is laid with extensive Posidonia beds. The IBA in its current extent includes only a small part of the Yelkouan and Cory’s Shearwater foraging areas in the Northeast Aegean Sea. In the future, when sufficient data are available, the boundaries of the IBA are expected to be expanded significantly to the north and west into the Thracian Sea, where large concentrations of shearwaters have been recorded.

Ornithological Importance

The site supports an important resident population of the Mediterranean Shag which breeds on cliffs along the southeastern coast of Samothraki island. During the post-breeding season the population increases suggesting immigration of individuals from other areas in the Northern Aegean Sea.

<table>
<thead>
<tr>
<th>species</th>
<th>related IBA</th>
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</table>

Other Species of Interest

Other seabird species regularly using the area for foraging include the Yelkouan Shearwater and Cory’s Shearwater. These shearwaters belong to the same populations which are regularly seen foraging in thousands throughout the entire Thracian Sea, particularly during the breeding season in spring and summer. Yelkouan Shearwaters are present in the wider area of the North Aegean Sea throughout the entire year although their numbers in the site are highly fluctuating. During the non-breeding season large flocks of Yelkouan Shearwaters, consisting of up to several thousands of individuals, are regularly sighted in the Thracian Sea during post-breeding dispersal in summer and during their return to their breeding sites throughout the Mediterranean Sea in late winter.

In the coastal area of Samothraki Audouin’s Gulls have been recorded during the post-breeding season, however up-to-date they have not been observed within the marine IBA.
The main human activities in the marine area include fishing and tourism. The marine area of the site extends along the eastern coast of the island which is the least accessible part. Therefore disturbance at breeding and roosting sites of the Mediterranean Shag is expected to be limited. Yelkouan Shearwater bycatch incidents in fishing nets have been recorded in the area in the past. Thus this threat is considered to be significant due to large numbers of shearwaters present in the area. Intense fishing activities in the Thracian Sea have an effect on fish stocks in the area thereby affecting seabird food availability. Fishing practices such as trawling have also been recognised as a potential threat to marine species and habitats.

All shipping traffic between the Aegean Sea and the Black Sea passes through the Dardanelles Strait. The vicinity of the IBA to this shipping route, in association with the heavy marine traffic and the permanent anticyclonic water circulation patterns around Samothraki island create conditions where any type of marine pollution or oil spill incident would directly threaten the marine and coastal areas of the IBA.
Site Description

This IBA, located along the eastern coast of Agio Oros Peninsula encloses a 1 n.m. marine extension from Cape Arapis at the northern-most part of Mount Athos Peninsula up to Cape Timiou Prodromou at the eastern-most end of the peninsula. It includes vital foraging and resting areas for the local population of the Mediterranean Shag breeding along the eastern coast of the peninsula, as well as important foraging areas for the Yelkouan Shearwaters. Significant Yelkouan Shearwater foraging areas, which are associated with rich fishing grounds of the Thracian Sea, also extend towards Thasos island and the Gulf of Kavala, beyond the current boundaries of the IBA.

Ornithological Importance

The area is of particular importance for the 20-30 pairs of Mediterranean Shag breeding along the coast and the Yelkouan Shearwaters which feed in the area, primarily during the breeding season. It is estimated that up to 1,000 Yelkouan Shearwaters regularly feed within the area. Up-to-date, no large Yelkouan Shearwater colony has been discovered in the area suggesting that these birds come from colonies in the wider area of the Northern and potentially Central Aegean Sea. Similarly, large Yelkouan Shearwater foraging congregations have been recorded in other nearby marine areas, such as around Thasos island and the Gulf of Kavala to the northeast, as well as the southern and eastern coast of Sithonia Peninsula to the south.

<table>
<thead>
<tr>
<th>species</th>
<th>related IBA</th>
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<th>max</th>
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</table>
Other Species of Interest

The wider marine area surrounding the Agio Oros Peninsula is regularly used by Cory’s Shearwaters for foraging and during movements between their colonies in the Central and Northern Aegean Sea and the Thracian Sea where they feed.

Uses, Threats, Management

Due to the autonomous administrative status of the area, human presence and activities in the coastal and adjacent marine areas are limited. It is anticipated that important threats for the Mediterranean Shag and Yelkouan Shearwater, such as coastal development, tourism, overfishing or illegal fishing practices, are unlikely to occur in the area.
Site Description

The IBA includes marine areas surrounding Alonnisos island, the uninhabited islands of Peristera, Kyra Panagia, Gioura, Peri, Psathoura and Skantzoura and the nearby islets of the Northern Sporades, as well as the eastern part of Skopelos island from Skopelos Bay on the northern side of the island up to Cape Veloni on the south of Skopelos. Inaccessible cliffs and islets are the main nesting sites for all common seabird species in Greece, including the Mediterranean Shag, Audouin’s Gull, Yelkouan Shearwater and Cory’s Shearwater, all of which use the surrounding marine areas for foraging and resting. Due to the large number of shearwaters foraging in the area, it is expected that Yelkouan and Cory’s Shearwaters from other regions in the North Aegean visit the site to feed. The area is also important for marine mammals, such as cetaceans and the Mediterranean Monk Seal. The area supports a large population of the latter, considered to be the most important for the species in the Mediterranean Sea. Posidonia beds extend along the coast of Alonnisos, Kyra Panagia and Psathoura.

Ornithological Importance

The Mediterranean Shag breeding population (85-134 pairs) is one of the largest in Greece. Nesting sites are dispersed throughout the entire IBA in small and medium-sized colonies. Mediterranean Shags forage mainly in coastal waters close to their colonies. After the breeding season a significant proportion of birds leave the marine area of the IBA. Increased post-breeding congregations in the neighbouring regions, i.e. Skyros (GR114) and Skiathos (GR198) islands, as well as colour ring recoveries, which were found up to 200 km away from nesting sites, suggest post-breeding dispersal of Mediterranean Shags in a wider region of the Northern Sporades.

Several Audouin’s Gull breeding sites have been located in the area during the last 15 years. Different
nesting sites tend to be used over consecutive years. Audouin’s Gulls forage and rest primarily in coastal waters adjacent to their colony sites during the breeding season but disperse throughout the Northern Sporades and beyond during the post-breeding season. The entire marine area of the IBA, particularly east of Alonnisos, is used by Cory’s and Yelkouan...
Tourism, fishing and livestock breeding are the main activities in the area. They are not considered intensely threatening for seabird breeding and roosting sites on land as well as in foraging areas at sea. Tourism has been rapidly increasing during recent years, but not in a way that may directly or seriously affect seabirds or other biodiversity in the area. However, the growing numbers of leisure boats, hunting and amateur fishing result in some degree of disturbance, especially to seabirds nesting on the islets. Grazing, and in some cases overgrazing, which takes place on most of the islands and islets being located in the southeastern part of the IBA.

Shearwaters for feeding and resting. In the Northern Sporades both shearwater species breed in small and medium-sized colonies and use waters adjacent to their colonies primarily for the formation of rafts before entering colonies at night. The total estimated number of Yelkouan and Cory’s Shearwater breeding individuals in the area is small compared to the total estimated number of birds that regularly forage in the area. It is therefore anticipated that Cory’s and Yelkouan Shearwaters from other colonies in the Northern or potentially Central Aegean Sea visit the IBA to feed. Additionally, large foraging congregations have been recorded to the east (i.e. towards Skyros island) and to the north (i.e. towards Chalkidiki) of the IBA.

Other Species of Interest

The Yellow-legged Gull breeding population is estimated at 450 pairs with their main colony sites located in the southeastern part of the IBA.

Uses, Threats, Management

Tourism, fishing and livestock breeding are the main activities in the area. They are not considered intensely threatening for seabird breeding and roosting sites on land as well as in foraging areas at sea. Tourism has been rapidly increasing during recent years, but not in a way that may directly or seriously affect seabirds or other biodiversity in the area. However, the growing numbers of leisure boats, hunting and amateur fishing result in some degree of disturbance, especially to seabirds nesting on the islets. Grazing, and in some cases overgrazing, which takes place on most of the islands and islets being located in the southeastern part of the IBA.
may cause degradation of Mediterranean Shag and Audouin’s Gull breeding habitats. Introduced mammals also pose a serious threat to seabirds and other bird species breeding on islets e.g. the Eleonora’s Falcon. Specifically, rats cause predation of eggs and chicks while rabbits degrade the quality of the breeding habitat.

Shipping traffic in the surrounding area is most intense in the marine area south of the site, associated with routes to the main ports of Volos and Thessaloniki. Therefore, accidental oil spills and marine pollution pose a continuous threat. Fishing activities such as illegal fishing practices, trawler and purse seine operation and unsustainable spear-gun fishing are controlled and are not considered to be a serious threat. The wider marine area surrounding the Northern Sporades is an important foraging area for the Cory’s and Yelkouan Shearwaters during the breeding as well as the non-breeding season, therefore special attention should be paid to reduce the risk of bycatch to seabirds.

To a large extent the marine IBA overlaps with the boundaries of the National Marine Park of Alonnisos, Northern Sporades (NMPANS). Following the establishment of NMPANS in 1992 and its Management Body in 2003, wardening, research and public awareness programmes are being implemented thus restricting and controlling the above-mentioned threats. Due to the area’s importance for seabirds and the Eleonora’s Falcon, HOS has been implementing systematic monitoring and innovative management actions for many years, such as rat population control on islets where the above-mentioned species breed, within the framework of two LIFE-Nature projects (LIFE03 NAT/GR/000092, LIFE07 NAT/GR/000285).
Site Description

This IBA is located to the northwest of Corfu island in the Northern Ionian Sea and contains marine areas adjacent to islands Mathraki and Othonoi and their surrounding uninhabited islets. It includes a marine extension surrounding these islands and islets. The marine area is used by Mediterranean Shags for foraging and resting, while Cory’s Shearwaters feed and form rafts close to their breeding sites. Mediterranean Monk Seals are also frequent in the site.
Ornithological Importance

Up to date, only two colonies of the Cory’s Shearwater and three colonies of the Mediterranean Shag have been found in the Ionian Sea. The breeding colonies of these two species located in Diapondia islands are the only ones in the Northern Ionian Sea, and are possibly linked to other populations in the Adriatic Sea. Therefore, it is anticipated that Cory’s Shearwaters foraging in the marine area north of Corfu, between Corfu and mainland Greece, as well as in the area around Paxoi and Antipaxoi islands, originate from this IBA. Further studies on the foraging sites of Cory’s Shearwaters are required.

<table>
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<td>P</td>
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</tr>
</tbody>
</table>

Other Species of Interest

Yelkouan Shearwaters and Yellow-legged Gulls are present in the area.

Uses, Threats, Management

The main threat for breeding seabirds comprises predation by introduced terrestrial mammals, primarily rats, as well as cats and dogs which are occasionally brought by visitors. Growing numbers of Yellow-legged Gulls pose another threat primarily to Cory’s Shearwaters because of increased competition for food and predation. High nest density at the Cory’s Shearwater colony indicates potential lack of other suitable nesting habitats in the IBA. Additionally, the main human activities directly affecting seabirds on uninhabited islets are intense tourist presence during summer, which causes disturbance at nesting and roosting sites, and artificial lighting which may cause disorientation and collisions of shearwaters at night.

The greatest potential threat to seabirds in the area is the proposed construction of a huge 948 MW offshore wind farm complex in the marine area between Othonoi, Mathraki and Ereikousa islands which partly overlaps with the marine IBA boundary and includes foraging areas of both species. The site is located adjacent to the main shipping route connecting the Greek ports of Igoumenitsa and Corfu with ports in the Adriatic Sea, thereby marine pollution and oil spills pose a significant threat. Bycatch of Cory’s Shearwaters in longlines and of Mediterranean Shags in nets is a potential threat which requires further assessment in the area.
Echinades, Kalamos and Atokos islands

Site Description

The IBA includes the entire marine area surrounding the 27 islands and islets of the Echinades archipelago (Oxieia, Makropoula, Makri, Vromonas, Petalas, Modi, Apasa, Soros, Gratharis, Skopolos, Xeropoula, Pontikos, Provatio, Tsakalonisi, Karlionisi, Pistros, Exo Petra, Philippou, Drakeni, Lambrinos, Sofia, Kalogiros and Praso). The islets are used as seabird breeding and roosting grounds. This insular area interacts with the rich ecosystem of the estuary of Acheloos River forming a complex of exceptional importance for biodiversity. The wider marine area between Kefalonia island, Lefkada island and continental Greece provides a refuge to many marine top predator species, including cetaceans, particularly dolphins, such as the Short-beaked Common Dolphin and Common Bottle-nosed Dolphin, as well as sharks and the Mediterranean Monk Seal. The sea in the IBA is predominantly shallow with the maximum depth just exceeding 100 m and abundant with Posidonia beds. The IBA contains 1 n.m. marine extensions surrounding all islands and islets of the Echinades archipelago, from Louros beach in Mesolongi in the east to Cape Peteinos in the north. This area adjoins and complements the marine coastal areas already included in IBA GR092 (Mesolongi and Aetoliko lagoons, Acheloos delta and Evinos estuary).

Ornithological Importance

The marine site is an important foraging and resting area for the resident population of the Mediterranean Shag which is estimated at 20-35 pairs and is the largest in the Ionian Sea.

Other Species of Interest

Cory’s and Yelkouan Shearwaters use the marine area for foraging. Telemetry of Cory’s Shearwater individuals breeding on Strofades islets (GR087) revealed that they use the Gulf of Patra for foraging, therefore birds foraging in the Echinades archipelago are assumed to belong to the same colony. Yelkouan Shearwaters are observed in the area during the non-breeding season, associated with post-breeding dispersal from their breeding sites. Yellow-legged Gulls breed on many of the uninhabited islets of Echinades.

Uses, Threats, Management

The main threat relating to colony sites is continuous tourist development which causes disturbance at Mediterranean Shag breeding and roosting sites. The site is adjacent to the large commercial port of Astakos and one of the main shipping routes in the Ionian Sea, connecting the port of Patra...
with other ports in the Ionian Sea and Italy, which passes through the Lefkada-Kefalonia Strait. Therefore, marine pollution comprises an important threat. Rapid development of aquaculture units in the coastal waters surrounding the islands and islets additionally contributes to marine pollution. Elevated levels of nutrients and heavy metals have been found, associated with fish farm operation in the Gulf of Astakos. The accumulation of organic matter on the seabed from surplus food and fish faeces has resulted in the degradation of Posidonia beds and other seabed communities. Furthermore, overfishing and illegal fishing practices employed by professional and amateur fishermen threaten the quality of the marine environment.

It is expected that this ecosystem will be affected in the future by the ongoing works for the diversion of river Acheloos upstream causing changes in the region of Mesolongi. This will in turn affect sedimentation rates, the annual freshwater volume flowing into the delta and hence productivity in the greater area.
Site Description

The IBA covers coastal marine areas along the eastern, southern and western coast of Zakynthos island, including the entire Bay of Laganas, engulfing Pelouzo and Marathonisi islets, as well as islets Agios Ioannis and Agios Andreas off the western coast of Zakynthos. The marine area encloses a 1 n.m. marine extension from Cape Kryoneri and the Bay of Zakynthos in the east up to Rilou Bay in the southern coast of Zakynthos. The rest of the marine area of the IBA includes a 0.5 n.m. marine extension along the western coast of Zakynthos. Located adjacent to the Hellenic Trench, the area is important for different species of cetaceans including the Sperm Whale, Cuvier’s Beaked Whale and all three dolphin species. The marine site provides suitable habitats and shelter to the Mediterranean Monk Seal, while numerous underwater breeding caves have been identified. The Bay of Laganas is considered to be one of the most important nesting sites for the Loggerhead Turtle in the Mediterranean. Extensive Posidonia beds are located mainly along the southern and eastern coast of Zakynthos. Steep rocky slopes and cliffs along the western coast of the island provide suitable nesting and roosting habitats for the Mediterranean Shag. The western and eastern coasts, as well as the Bay of Laganas, comprise important foraging grounds both for the Mediterranean Shags and the Cory’s Shearwaters of the area. The boundaries of the marine IBA are expected to be significantly extended in the future when sufficient data are available to delineate the most important Cory’s Shearwater foraging areas around Zakynthos and in the Gulf of Patras.

Ornithological Importance

The area hosts one of the three Mediterranean Shag populations in the Ionian Sea. Large post-breeding congregations of this species are formed in Laganas Bay.

Other Species of Interest

The wider marine area around Zakynthos comprises an important foraging area for the Cory’s Shearwater, particularly for birds breeding on Strofades islets (GR087) during spring and summer. Yelkouan Shearwaters associated with post-breeding dispersal are occasionally present in the area during the non-breeding season. More than 250 pairs of the Yellow-legged Gull breed in the IBA.

Uses, Threats, Management

Mediterranean Shag nesting sites are located along steep cliffs of the western coast of Zakynthos. Disturbance caused by marine tourist activities close to these breeding sites are assumed to be relatively low, however the steadily increasing marine tourism during the summer months causes
significant disturbance at the species’ foraging and roosting areas. The wider marine area around Zakynthos island comprises the most important foraging ground for Cory’s Shearwaters breeding on Strofades (see GR087). Cory’s Shearwaters have been frequently reported to be accidentally caught in bottom longlines therefore bycatch is considered to be an important threat in this area. Mitigation measures should be implemented to reduce the impact of bycatch on the local population of this species. Marine pollution caused by marine traffic in the area poses a potential threat. Illegal fishing practices cause degradation and destruction of marine habitats which are vital for seabirds. The operation of a landfill on the slope of Skopos overlooking the Bay of Laganas led to the significant increase of the Yellow-leged Gull populations. These predators exert pressure on Mediterranean Shags, as well as on Loggerhead Turtle hatchlings. Coastal development, primarily related to tourism, is considered to be a threat for the Mediterranean Shag at particular foraging and roosting sites. The Marine National Park of Zakynthos, established back in 1999, extends over the Bay of Laganas and surrounding marine areas and is entirely included within the boundaries of the marine IBA. Conservation actions carried out by the Management Body of the National Park, which aim primarily at the protection of the Loggerhead Turtle and the Mediterranean Monk Seal, also contribute to reducing the impacts of threats related to seabirds within the area of its jurisdiction.
Site Description

Strofades is an islet complex consisting of the islets of Stamfani and Arpyia, as well as their surrounding rocks. These remote volcanic islets are located 25 n.m. south of Zakynthos island and west of the Peloponnese. They are among the most distant islets to mainland Greece and are surrounded by the deep waters of the Ionian Sea. The low-lying rocky coast of the islets provides ideal shearwater nesting sites. A monastery dating back to the beginning of the previous millennium is located on the larger islet, its land extending over a large area of cultivated fields in the centre of the island.

The IBA includes a 2.7 n.m. marine extension around Strofades. The deep waters of the adjacent Hellenic Trench provide ideal environment conditions for cetaceans, such as the Sperm Whale, the Curvier's Beaked Whale and all three dolphin species, which are frequently observed in the area.

Ornithological Importance

Strofades islets host the largest colony of the Cory’s Shearwater in the Eastern Mediterranean Sea. Its exceptional population size and isolation from other colonies in the Aegean Sea, but also in the Central Mediterranean and Adriatic Seas place it among the most important colonies of the species in Greece. Large Cory’s Shearwater rafts are regularly observed in the marine area surrounding the islets. These coastal waters are also shearwater foraging grounds, particularly during the breeding season which extends from spring until autumn. Telemetry data revealed that the main foraging areas of those Cory’s Shearwaters breeding in the area are located in the wider area around Zakynthos and Kefalonia islands and the Gulf of Patras (see GR084, GR086).

Other Species of Interest

Yelkouan Shearwaters and Audouin’s Gulls have also been recorded in the area however they do not breed on Strofades islets.

Uses, Threats, Management

The main threat to the Cory’s Shearwater population on Strofades is the existence of large rat populations. Rats have been accidentally introduced on the islets by man and they prey on shearwater’s eggs and chicks. Additional predation is caused by Yellow-legged Gulls and cats.

The site falls under the jurisdiction of the Marine National Park of Zakynthos, established in 1999.
Wardening is enforced during spring and autumn bird migration periods in response to the increased illegal hunting activities which used to occur both on land and also from vessels. The presence of wardens has increased the protection status of the site on all levels and has improved the conditions for breeding seabirds. A specific permit is necessary to access Strofades which provides further control of human presence on the islets.

The most important threat at sea is considered to be the accidental bycatch of seabirds in fishing gear, primarily in bottom longlines. Based on questionnaires filled in by fishermen, up to several hundred Cory’s Shearwaters may be getting caught in longlines every year in the South Ionian Sea (see also GR086). These bycatch rates may be unsustainably high, despite the fact that an extensive monitoring programme on Strofades over the last few years, did not reveal any recent Cory’s Shearwater population decline. Additionally, marine accidents and subsequent pollution are a threat to seabirds in the area due to intense shipping traffic in the South Ionian Sea.
Site Description

The IBA includes marine areas along the eastern and northern coast of the southeastern tip of Evvoia. It encloses a 1 n.m. marine extension from Cape Kydonia in the north up to Cape Mandili in the south, including islets Mantilou and Arapis, the latter located at Cape Kafireas, of the homonymous strait. Marine habitats include Posidonia beds and reefs along Cape Kafireas, both of which have been preserved in excellent condition. Mediterranean Monk Seals are also present in the area.
Ornithological Importance

The site is of particular importance for the Audouin’s Gull. During recent years one of the largest colonies of Audouin’s Gull in Greece (up to 40 pairs) has been discovered here, linking the colonies of the Central Cyclades to those of the western part of the North Aegean Sea (Skyros, N. Sporades). Birds breed on an uninhabited islet and forage in coastal waters primarily along the eastern coast of Evvoia as well as along the coast of the neighbouring Andros island. There is also a resident population of the Mediterranean Shag in the area. Birds breed on steep cliffs and inaccessible sites and use the entire marine area of the IBA for foraging. The vicinity of this population to a much larger one on Andros suggests a close link between these two Mediterranean Shag populations.

Yelkouan Shearwaters are regularly present within the site, as well as in the wider marine area of Kafireas Strait, almost all year round. Large flocks have been observed both during the breeding and the non-breeding season. It is estimated that Kafireas Strait also serves as a migratory bottleneck although further data from coastal counts and boat-based surveys are required to establish the number of birds using the area and its geographical extent. Therefore in the future, the final pelagic marine IBA at Kafireas Strait is expected to have a significantly larger extent compared to the current one.

Other Species of Interest

Cory’s Shearwaters regularly feed in the marine area within and around the IBA. The origin of these birds still needs to be established as no shearwater colonies have been located in the vicinity. The breeding population of the Yellow-legged Gull in the area exceeds 300 pairs. During the non-breeding season Yellow-legged Gulls originating from the wider area of the South Evvoikos Gulf use uninhabited islets in the IBA as roosting sites.

Uses, Threats, Management

The main threat to Audouin’s Gulls breeding in the area is predation of eggs and chicks by Yellow-legged Gulls. Additionally, large raptors prey on gulls. Nesting seabirds are also affected by disturbance caused by fishing and recreational boats visiting breeding areas. An onshore and offshore marine wind farm (150 MW) is proposed to be constructed, covering almost the entire breeding and foraging range of the Audouin’s Gull and a considerable part of the Mediterranean Shag foraging area in the IBA. This plan, if realised, will pose a significant threat for the entire local population of the Audouin’s Gull since the installation of wind turbines on its breeding islet will seriously degrade and potentially destroy the breeding habitat as well as probably cause displacement of the colony. The offshore component of the wind farm would also threaten a large proportion of the local Mediterranean Shag population and shearwaters visiting the area.

The area is adjacent to one of the major ship transit routes connecting the Black Sea and Northern Aegean Sea with the Western Cyclades and eventually the Central Mediterranean Sea. Due to the large number of ships passing by the site, in association with the extreme weather conditions occurring in Kafireas Strait, the risk of marine accidents, oil spills and subsequent marine pollution is high. The site is located at the northeastern edge of South Evvoikos Gulf which is an important fishing area, with recorded Cory’s Shearwater bycatch incidents. Therefore, seabird bycatch may affect local breeding and foraging seabird populations.
Site Description

The marine area of the IBA surrounds the entire island of Skyros, including the uninhabited islets of Skyropoula, Rineia, Valaxa, Plateia, Sarakino, 30 smaller islets and rocks along the southern, southwestern and western coast of Skyros, and the islet group of Podies and Pyrgoi in the north of Skyros. The marine area enclosing the islet of Prasouda, located approximately 30 km southwest of Skyros island, is also part of this IBA. The IBA boundary is made up of a 1 n.m. marine extension along the southeastern coast of Skyros, Sarakino, Valaxa, Skyropoula and Prasouda islets, a 2 n.m. extension along the northern and eastern coast of Skyros and the islet group of Podies and Pyrgoi and a 2.7 n.m. extension around Rineia islet. The islets north of Skyros are volcanic, while the rest have a calcareous substrate. They exhibit large diversity of vegetation types and provide a variety of suitable nesting and roosting habitats for seabirds. The surrounding waters are very rich fishing grounds, which favour the presence of large seabird populations and marine mammals, such as the Sperm Whale, Risso’s Dolphin, Striped Dolphin and Common Bottle-nosed Dolphin, as well as the Mediterranean Monk Seal.
Ornithological Importance

The site is important for all five seabird species of conservation concern in Greece. The local population of the Mediterranean Shag (102-104 pairs) is among the largest in Greece and together with the neighbouring populations of the Northern Sporades (GR065 and GR198) comprises one of the species main strongholds in the Aegean Sea. The post-breeding population is large (237-374 individuals) suggesting that wintering birds remain in the site. Mediterranean Shags feed primarily in coastal waters along the northern, western and southern part of the area.

Audouin's Gulls breed on uninhabited islets along the western, southwestern and southern coast of Skyros. During the breeding season Audouin's Gulls feed mainly in the vicinity of their colonies, while during the post-breeding season they disperse throughout the site and beyond, towards Evvoia island.

The main Cory's and Yelkouan Shearwater colonies are located on islets southwest of Skyros. The Cory’s Shearwater breeding population (81-156 pairs) is estimated to be the second largest in the North Aegean Sea. These two shearwater species use coastal waters, including the continental shelf extending along the northeastern and eastern coast of Skyros for feeding, resting and rafting. The foraging range of shearwaters breeding on islets...
of the site extends far beyond the marine areas of the IBA, particularly towards Evvoia and the Gulf of Kymi to the southwest and towards the Northern Sporades to the northwest. However, further surveys are required to provide data which will support the expansion of the marine IBA to these pelagic areas. Additionally, rich fishing grounds around Skyros regularly attract large flocks of Yelkouan Shearwaters during the late breeding season and the post-breeding season, the size of which may exceed 5,000 individuals.

The first known breeding site of the European Storm-petrel in Greece was discovered in 1982 on one of the islets of this IBA. There are regular sightings of foraging individuals in the wider marine area around Skyros however, the foraging range of birds breeding in the site remains unknown.

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Other Species of Interest

Yellow-legged Gulls breed on almost all uninhabited islets of the site. Their breeding population exceeds 400 pairs. They use the entire marine area of the IBA and are regularly seen flying between Skyros and Evvoia.
The main threat to nesting seabirds on the uninhabited islets surrounding Skyros is the predation of eggs and chicks by rats, as well as Yellow-legged Gulls. The quality of seabird breeding habitats is also affected by livestock breeding and hunting, while the presence of tourist and fishing boats in the vicinity of seabird colonies may cause disturbance. Another threat arises from a 9 MW wind farm proposed to be constructed on the islet hosting the largest colonies of Cory’s and Yelkouan Shearwaters in the IBA, which if realised would cause the degradation or even destruction of the species’ nesting habitat. Additionally, the presence of wind turbines could lead to injuries and casualties inflicted from collisions, while their artificial lighting could disorientate the shearwaters returning to their colony at night.

The wider marine area surrounding Skyros comprises important fishing grounds. Numerous fishing vessels travel through the area on their way from the North Aegean Sea towards the main fishing port of Kymi, on the eastern coast of Evvoia. Trawling activities occasionally take place in coastal waters causing degradation of the marine environment and Posidonia beds. Interactions between fisheries and seabirds, particularly shearwaters which occur in the area in large concentrations, may lead to accidental seabird bycatch. The main shipping route towards the Black Sea passes east of Skyros, thus the site is placed at a considerable risk of oil and chemical pollution.

Due to their importance for seabirds and the Eleonora’s Falcon, most uninhabited islets of Skyros have been the subject of specific management actions within the framework of two LIFE-Nature projects (LIFE07 NAT/GR/000285 and LIFE09 NAT/GR/000323) aiming at improving breeding habitats for these species. Management measures include rat eradications, Yellow-legged Gull population control, removal of livestock from small uninhabited islets, construction of artificial nesting sites and recovery of islet vegetation.
**Site Description**

The IBA contains marine areas surrounding the remote and uninhabited rocky islets of Falkonera and Velopoula in the Myrtoan Sea, located between the Peloponnese and the Cyclades. Steep coastal cliffs of sedimentary origin with fallen rocks and shrubs provide suitable nesting sites for seabirds. The islets are surrounded by deep sea waters, reaching a maximum depth of almost 1,000 m. The boundary of the marine IBA includes a 0.5 n.m. marine extension around Velopoula and Falkonera islets. Available data on the marine distribution of seabirds in the area are limited therefore the boundary of the IBA may be extended in the future when more information, particularly on shearwaters, is collected.

**Ornithological Importance**

A small and isolated breeding population of the **Mediterranean Shag** is dispersed along the rocky coast of the islets (min. 15 pairs).

### Other Species of Interest

Cory's and Yelkouan Shearwaters have been recorded foraging at sea in the wider marine area surrounding the islands of the Western Cyclades. These waters may also be important for migrating Yelkouan Shearwaters, as they are located between the migratory bottleneck of the Makronisos Strait (GR252) and Elafonisos Strait (GR129). However, research in the area has been hindered by the remoteness of the site. Further surveys are necessary in order to assess the importance of the surrounding marine areas for Yelkouan Shearwater migration and the presence of shearwater breeding colonies on the islets.

### Table

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Uses, Threats, Management

The islets are remote, located at a large distance from inhabited islands and the mainland, therefore human activities are limited. Nevertheless, overgrazing by livestock has caused seabird nesting habitat degradation. The potential installation of wind farms on the islets is expected to have a negative impact on the nesting seabirds in the area, as well as other island nesting birds such as the Eleonora’s Falcon. The site is located along the major shipping route connecting the Black Sea and the Central Mediterranean Sea. Therefore, marine pollution comprises the main threat to seabirds in the marine environment, through accidental oil or chemical spills from passing ships. The most renowned shipping accident in Greek modern history occurred in 1966 off the coast of Falkonera islet with numerous casualties. The incident triggered the establishment of a search and rescue service, now known as the Joint Rescue Coordination Center (JRCC) of the Ministry of Mercantile Marine.
**Site Description**

The IBA includes the marine area around Kythira island, to a distance of 1 n.m. from the coast, excluding part of the northeastern coast from Cape Spathi until 1 n.m. southeast from Pelagia port. The marine area surrounding Avgo islet in the south extends to 2.7 n.m. from the coastline. To the west and northwest, the continental shelf drops steeply reaching a depth of 500 m, while the deepest point in the area is found 2.5 n.m. south of Avgo islet. To the east, the seafloor slopes more gently till depths of about 200 m. Diakofti is the current port of the island, established in 1995, through the construction of a bridge connecting the mainland with Makronisi islet.

The area engulfs 22 islets, rocks and abundant reefs. The islets to the east are low-lying, covered by phrygana and halophytic vegetation creating suitable nesting habitat for seagull species. Vertical coastal cliffs along Kythira and nearby islets are typical breeding sites for the Mediterranean Shag and Cory's Shearwater. Due to its proximity to the Hellenic Trench the Bay of Agios Nikolaos is very important for cetaceans, such as the Sperm Whale, Cuvier’s Beaked Whale, Bottle-nosed Dolphin, Striped Dolphin and Short-beaked Common Dolphin, as well as for the Mediterranean Monk Seal and the Loggerhead Turtle.

**Ornithological Importance**

The marine IBA has been designated for its importance for three breeding seabirds. The site hosts one of the oldest known colonies of *Audouin's Gull* (14-45 pairs), regularly interchanging on 3 uninhabited islets. Historically, the colony was located on Makronisi islet, only to be displaced to its current distribution following the construction of the port of Diakofti. Since then, the colony has maintained its nesting sites even after a significant marine accident occurred in 2000 during which a cargo ship was grounded on Prasonisi islet. The ship’s carcass still remains on-site today. The breeding population trend exhibits a moderate but steady decline over the last 15 years. Although, the
observations and radio-tracking of Audouin's Gull individuals show that adult birds during the breeding period forage primarily along the coast, several individuals have been recorded feeding beyond Cape Spathi in the north, crossing the Strait of Elafonisos and possibly feeding within the Bay of Neapoli. Older observations have recorded groups of up to 15 individuals feeding within the Bay of Agios Nikolaos on the southeast of Kythira.

The **Mediterranean Shags** breeding in the area (45-60 pairs) use almost the entire marine area surrounding Kythira and nearby islets for feeding. Among pelagic seabird species present in the area, only the **Cory's Shearwater** meets IBA criteria for its breeding population. Flocks of up to several hundred individuals are regularly observed foraging in the Bay of Agios Nikolaos and the southern marine area during the breeding season.

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**Other Species of Interest**

Kythira is one of the most important areas for migrating birds in Greece. Apart from raptors and passerines which migrate along a north-south direction, the area also connects the Aegean with the Ionian Sea and the Central Mediterranean Sea through the Straits of Elafonisos and Kythira. It is anticipated that large numbers of seabirds pass through these straits during migration. Flocks of up to 2,000 *Yelkouan Shearwaters* have been recorded east of Kythira, along the Strait of Elafonnisos and in the surrounding gulfs of the Peloponnese. Further surveys are required to establish the importance of the area for migrating seabirds. Although Yelkouan Shearwaters are frequent in the area, no breeding site has been confirmed to date. Rare observations of the *European Storm-petrel* at sea have also been recorded in the past in the region west of the island.
Located at the southern-most tip of the Peloponnese, Kythira island lies along one of the main Mediterranean transit routes, used by thousands of tanker and trading vessels each year to and from the Black Sea and Aegean Sea. Since vessel activity is projected to rise even further over the next decade, marine pollution poses the most important threat for this marine IBA. Already in 2000, the Audouin’s Gull colony suffered significant crude oil pollution from the above-mentioned accident which affected the whole eastern coast of Kythira. In addition to this, numerous small-scale pollution incidents go unrecorded each year, mainly through illegally pumped bilge water. However, mercury levels from Audouin’s Gull chick feathers and PCB and organochlorine pesticide residues in unhatched eggs were found to be too low to cause adverse effect on the breeding success (1997-9).

Fisheries operate intensively around the coast of Kythira, mainly trawler and purse seine vessels from the ports of Neapoli, Gytheio and the rest of the Peloponnese and western Crete, as well as small scale coastal fishing vessels using nets and longlines. Illegal fishing methods, such as dynamite fishing, are still in use. The decline of fish stocks due to intensive trawler and purse seine fishing, as well as accidental trapping in fishing gear (nets and longlines) comprise long-term threats for all seabird species in the region.

Kythira island is considered a low intensity tourist destination during summer and most infrastructures and activities are focused around the beaches of Plateia Ammos, Agia Pelagia, Paliochora, Diakofti, Fyri Ammos and Kapsali. However, yachting and other marine recreational activities are increasing. Disturbance at breeding colonies caused by the presence of visitors is thus a potential threat, although the steep and rugged relief of the islets often impedes disembarkation on parts of the coastline. Another important threat for breeding species is the predation of eggs and chicks by introduced and natural predators such as rats, the Peregrine Falcon, Yellow-legged Gull and Hooded Crow.

Coastal development is mainly concentrated around the settlements of Kapsali and Diakofti ports, mostly related to tourist infrastructures and the construction of summer housing, although still considered of low intensity.
Site Description

The marine IBA includes the coastal marine area along the northwestern, western and southern coast of Limnos island and nearby islets extending 1 n.m. west of Cape Trigies in the north, until Cape Agia Irini in the southeast. The area engulfs more than 15 islets, covered mainly by phrygana, which are located 0.2-0.7 n.m. off the coast. These islets, as well as the steep coastal cliffs and rocky coastline of Limnos provide a multitude of suitable nesting and roosting sites for seabirds. Apart from seabirds, dolphins and the Mediterranean Monk Seal are present in the area. The marine IBA incorporates a 0.5 n.m. marine extension along the northern coast of Limnos and up until Cape Mourtzeflos in the west, a 1 n.m. marine extension along the western and southern coast of Limnos and nearby islets, as well as a 2.7 n.m. marine extension around Sergitsi islet in the northwestern tip of Limnos. Although the interior part of Moudros Bay is used by seabirds, it is not included in the current marine IBA, since it is already part of the IBA GR132.

Ornithological Importance

The breeding population of the Mediterranean Shag (120 pairs) is the third largest in the Northern Aegean Sea. They forage along the entire marine area of the IBA. Only a part of the breeding population remains in the area all year round (up to 104 individuals have been recorded), while the majority disperses during the post-breeding season. A marked increase in the post-breeding population has been recorded in the wider area of Thasos, located approximately 70 km north of Limnos island. Thus it is suspected that part of the Mediterranean Shag population of Limnos spends the post-breeding period around Thasos and...
in the vicinity of Nestos river estuary. The IBA is one of the main breeding sites of the Audouin’s Gull in the Northern Aegean Sea. The colony sites are located in the northern and southern part of the IBA. The birds use neighbouring coastal waters for feeding and resting. Significant numbers of the Yelkouan and Cory’s Shearwater breed in the IBA. Colony raft formation is restricted within the IBA marine boundary. Feeding shearwaters have been recorded in coastal waters throughout the entire marine area of the IBA however most foraging activity takes place beyond the IBA’s boundary. Flocks of both shearwater species, consisting of up to several hundred individuals, are regularly seen foraging at open sea throughout the Thracian Sea to the north of Limnos (from

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Samothraki island in the east to Chalkidiki Peninsula in the west, as well as towards the east (Gökçe Ada island) and southeast (Lesvos island). All the above areas comprise rich fishing grounds and therefore are favourite shearwater foraging sites. No known colonies occur within those foraging areas, thus it is assumed that some of these foraging shearwaters originate from colonies on Limnos. The only available data on the pelagic shearwater distribution in the area originate from ESAS surveys but these are not sufficient to delineate pelagic foraging areas. Further telemetry surveys are required to establish the foraging distribution of shearwaters breeding on the islets of Limnos.

**Other Species of Interest**

**Yellow-legged Gulls** breed primarily on uninhabited islets (500-600 pairs) and disperse through the entire IBA in search for food. **European Storm-petrels** have been recorded in coastal waters and pelagic areas around Limnos. Coastal wetlands along Moudros Bay host numerous waterbird species during the breeding, migration and wintering period, which have been included in IBA GR132. Several waterbird species also use marine areas within the bay.
The main threat for seabird breeding colonies on islets and along the coast of Limnos is disturbance caused by tourists and fishermen. Other threats include rat and Yellow-legged Gull predation of seabird chicks and eggs. Possible construction of a military shooting range on the islet of Sergitsi poses a serious threat to all four seabird trigger species of the IBA.

The main threat to seabirds in the marine area around Limnos, especially for Cory’s and Yelkouan Shearwaters, is the potential construction of large offshore wind farm complexes (1,193 MW) along the eastern and southeastern coast of the island where extensive Posidonia beds also occur. The installation and operation of offshore wind farms would cause direct degradation of seabird foraging habitats in the shallow waters extending from Limnos to Gökçe Ada. Large numbers of shearwaters fly through the area on a daily basis on their way to foraging areas in the Northern Aegean and Thracian Sea. Therefore wind farms would introduce a barrier effect and potentially cause direct mortality through collisions. Seabird bycatch, primarily in bottom longlines, poses another threat to Cory’s and Yelkouan Shearwaters in the marine area surrounding Limnos, particularly due to the presence of large flocks of shearwaters during the breeding season.

Limnos island is located to the east of the main shipping route between the Aegean and the Black Sea, thus the IBA runs a significant risk from accidental oil spills and subsequent marine pollution.
Site Description

Agios Efstratios is an isolated island in the North Aegean Sea, located upon the Sporades-Limnos Plateau, approximately 30 km south of Limnos Island. The marine IBA consists of the coastal marine area surrounding the entire island of Agios Efstratios and the nearby islets Agioi Apostoloi, Agia Eleni and Thaskoloi. Its boundary encloses a 1 n.m. marine extension along the coast of Agios Efstratios and neighbouring islets, vital for foraging and resting of local seabird populations, as well as foraging shearwaters which breed at other sites in the Aegean Sea. The largest part of the island is characterised by hills dominated by phrygana with vertical rocky outcrops along the coastline, especially to the east. The rocky substrate of Agios Efstratios island consists primarily of schists, shales, and volcanic rocks, with only some limestone patches. Steep coastal cliffs and rocky coastlines are used by seabirds for breeding and roosting.

The sea surrounding the island is relatively shallow, with depths up to 100 m and extensive Posidonia beds. The Common Bottle-nosed and Short-beaked Common Dolphin, as well as the Mediterranean Monk Seal have been recorded in the wider marine region.

Ornithological Importance

The marine IBA has been designated for the breeding population of the Mediterranean Shag, estimated at 48-60 pairs. A significantly lower post-breeding population (51 individuals) suggests that following the end of the breeding season, part of the local Mediterranean Shag population disperses to neighbouring marine areas.

Other Species of Interest

Cory’s and Yelkouan Shearwaters forage in the wider marine area around Agios Efstratios, however the concentrations of shearwaters are lower than in other neighbouring sites e.g. Skyros island, Limnos island and the Northern Sporades. Yellow-legged Gulls are present in the area all year round, with maximum numbers recorded during the breeding season (50-70 pairs).

Uses, Threats, Management

The main human activities on Agios Efstratios include livestock breeding and fisheries. A major threat related to Mediterranean Shag nesting sites situated on coastal cliffs of the main island and surrounding islets is rat predation of eggs and chicks. At sea, bycatch in fishing gear (nets and longlines)
poses a threat for the Mediterranean Shag and shearwater species. Marine habitats are also
degraded by the operation of trawlers, mainly
originating from Northern Greece, unsustainable
speargun fishing and illegal fishing with dynamite.
Due to its vicinity to the Dardanelles Strait,
continuous shipping traffic creates a permanent
threat of oil spills and other sources of marine
pollution originating from ships. A large offshore
wind farm (480 MW) has been planned, extending
over the main Mediterranean Shag foraging area on
the eastern side of Agios Efstratios. The installation
of the proposed farm, consisting of more than 80
wind turbines, would pose a serious threat to the
species through decreased available foraging areas
and also by creating a barrier between the marine
area and the coastal habitats.
Site Description

The area is located in the north-northwestern coast of Lesvos island. It includes the marine area around the island of Agios Georgios Petras and its four nearby islets, as well as the coastal waters from Cape Nisi in the west up to Mount Rachoula in the east. The site incorporates a 0.5 n.m. marine extension. The marine area is characterised by shallow coastal waters close to the islets, reaching greater depths up to 200 m at its northern limits.

The islets are covered primarily by phrygana, while on Agios Georgios there are small stands of planted pines. These islets together with the steep and rocky sections of the coastline of Lesvos provide suitable nesting or resting sites for coastal seabirds. The Common Bottle-nosed Dolphin and the Mediterranean Monk Seal have been recorded in the region.
Ornithological Importance

The IBA is an important breeding site for **Audouin’s Gulls** (9-37 pairs). Birds forage in adjacent coastal waters. The local breeding population seems to have experienced a decline during the last decade. Interannual fluctuation of the breeding numbers in the IBA suggests that the local breeding population is also closely related to those in the neighbouring breeding sites on islets of northeastern Lesvos (GR136) and western Lesvos (GR134). Every year breeding Audouin’s Gulls choose one of the three IBAs on Lesvos to nest, therefore these birds are assumed to belong to a single breeding population.

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<td>good</td>
<td>A1, C1</td>
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</table>

Other Species of Interest

There is a small resident population of **Mediterranean Shags** (8-10 pairs) and a breeding population of **Yellow-legged Gulls** (200-250 pairs) in the area. **Cory’s and Yelkouan Shearwaters** feed here and use the strait between Lesvos island and the Turkish coast to move between western Lesvos and Mytilini Channel in the east. Cory’s Shearwaters are present in the area during the breeding season, while Yelkouan Shearwaters also occur during the non-breeding season.

Uses, Threats, Management

There are man-made structures on the islet of Agios Georgios, such as a church, a well, a cistern and a small building. The main threat at Audouin’s Gull and Mediterranean Shag colonies, especially on uninhabited islets, is disturbance caused by visiting tourists and local inhabitants, who visit the islets mainly for swimming. Disturbance caused by human presence during the breeding season and the introduction of domestic predators on islets may have a negative impact on nesting seabird populations. Threats at sea include marine pollution and seabird bycatch, particularly for Yelkouan Shearwaters which are present in the area in significant numbers during the breeding and non-breeding seasons.

Audouin’s Gull (**Larus audouinii**)
Site Description
The marine IBA is located in the Bays of Makris Gialos and Lagada on the northeastern coast of Lesvos island, adjacent to the Mytilini Strait. Its boundary includes the marine area surrounding the islets of Kydonas, Prasologos, Monopetra and the Tokmakia islet group consisting of 10 islets (Panagia, Barbalias, Mavri Plakouda, Aspronisos, Tsoukalas, Aspri Plakouda and smaller islets). The marine area contains a 0.5 n.m. marine extension from Cape Feros in the north, to Mistegna Bay in the south. Waters in the area are shallow, rarely exceeding the depth of 50 m. The islets in the IBA are mainly low-lying, covered with scarce shrub vegetation, smooth coasts and small beaches, with the exception of Aspronisos and Aspri Plakouda islets which are characterised by steeper coastline. They provide necessary nesting, resting and roosting sites for seabirds.

Ornithological Importance
The IBA has been designated for its importance for the Audouin’s Gull which holds here a medium-sized breeding population (28-31 pairs). Colony sites interchange between two uninhabited islets in different years. Birds breeding in the IBA are considered to belong to the same breeding population which also uses islets in neighbouring IBAs i.e. GR134 and GR135. Their foraging and resting areas are restricted to adjacent coastal marine waters.

Other Species of Interest
Mediterranean Shags (>20 pairs) breed, forage and roost in the area. Their foraging areas overlap with those of the Audouin’s Gull. Cory’s and Yelkouan Shearwaters regularly forage in the Mytilini Strait. More than 1,000 pairs of Yellow-legged Gulls breed on the islets in this area.
The islets, especially Aspronisos which has a beach suitable for swimming, are regularly visited by local inhabitants and tourists during summer. Most islets host game species and now been designated as a Wildlife Refuge, thus disturbance caused by hunting is limited. Introduction of domestic animals on the islet (e.g. cats, dogs) has been recorded in the past and may lead to the abandonment of seabird colonies. Livestock grazing, the unintentional introduction of rats and the superabundance of Yellow-legged Gulls which prey on eggs and chicks, cause severe degradation of seabird breeding habitats and may lead to the overall breeding failure of seabird colonies. Marine pollution and seabird bycatch are potentially a threat to seabirds caused by marine traffic and fisheries in the area.
Site Description

The Northern Aegean Sea is one of the main regions in Greece where Yelkouan Shearwaters spend their post-breeding period. During this time shearwaters form large congregations, particularly in areas which are rich in prey. One of these sites is Kalloni Gulf, located in south Lesvos island. It is a semi-enclosed and shallow gulf, with an average and maximum depth of 10 m and 19 m respectively. It is connected with the rest of the Northern Aegean Sea via a narrow mouth at its southwestern end. The gulf is famous for its abundant fish populations, particularly sardines. Posidonia beds are present in the area. The marine IBA includes the entire marine area of Kalloni Gulf up until the mouth of the gulf at the point of Capes Platy and Kalloni. Mediterranean Monk Seals and dolphins have been recorded in the gulf.
Ornithological Importance

The area is an important foraging area for Yelkouan Shearwaters, primarily during the non-breeding season. Congregations of up to 800 individuals are regularly observed feeding, mainly on shoals of sardine throughout the entire area of the gulf.

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</table>

Other Species of Interest

Small numbers of Mediterranean Shags are present in the gulf all year round. Audouin's Gulls have been recorded in the area during the non-breeding season. Kalloni Gulf is surrounded by coastal wetlands hosting numerous migrating, breeding and wintering waterbirds which also use the adjacent marine areas of the gulf.

Uses, Threats, Management

Kalloni Gulf is an important fishing ground, particularly for sardines and shellfish, as well as other fish species. The marine environment has been affected mainly by nitrate and phosphate pollution from land based sources, such as municipal wastewater, agricultural drainage and olive press wastes, which end up in the gulf through numerous streams, and other pollution at sea. Eutrophication enhanced by this pollution has caused the degeneration of phyto- and zoobenthic communities while, bottom-fishing activities, such as scallop dredging has been found to cause long-term changes in the structure and biodiversity of sponge assemblages. Intensive fisheries operation may pose an important threat to Yelkouan Shearwaters through accidental bycatch, especially when large foraging flocks are present.
Site Description

The marine IBA is located in the region of Psara and Antipsara islands in the Northern Aegean Sea. It consists of a 2.7 n.m. marine extension around Antipsara, including coastal marine areas along the western coast of Psara, from Cape Pounta Roussos in the northwestern point down to Cape Triphylli at the southwestern tip of the island. The marine IBA engulfs 14 uninhabited islets surrounding Antipsara and western Psara. The islands are dry, with minimal tree cover and mainly covered by phrygana. The coastline is characterised by steep coastal cliffs and rocky shores which are particularly important nesting and resting sites for seabirds and colonial raptors. There are degraded sand dune systems and sandy beaches on the southern coast of Antipsara. Apart from seabirds, the Mediterranean Monk Seal has been recorded in the marine area of Psara.
Ornithological Importance

The area hosts one of the largest Yelkouan Shearwater colonies in the Northern Aegean. The birds use waters adjacent to the colony for rafting and feeding. Large numbers of rafting birds (up to 465 individuals) have been recorded gathering within the marine IBA during the evening, while foraging flocks are smaller. This suggests that the foraging range of birds breeding in the site greatly exceeds the area of the marine IBA. Further telemetry surveys are required to establish their foraging areas.

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Other Species of Interest

Colonies of the Cory’s Shearwater (25-80 pairs), Mediterranean Shag (34 pairs) and Yellow-legged Gull (60 pairs) also occur in the IBA. Cory’s Shearwaters use the marine area around Antipsara for rafting and foraging. The Mediterranean Shags breed along the coast of Antipsara and Psara and use the adjacent coastal waters for foraging and resting. During the post-breeding season only part of the Mediterranean Shag breeding population remains in the area, while the rest disperse to other nearby sites.

Uses, Threats, Management

The main threats identified on the islets where seabirds breed are disturbance caused by human presence and predation by rats and Yellow-legged Gulls. Intense marine traffic between Psara and Chios places the IBA at a continuous risk of marine pollution. Overfishing and seabird bycatch are also suspected to have negative effects on the local populations of seabirds, as well as on regional populations of shearwaters in the Northern and Central Aegean Sea which use the marine area around Psara and Antipsara.
Site Description

The IBA engulfs the entire coastal marine area of Fournoi and Thymaina islands, apart from the area surrounding the northern peninsula of Fournoi from the Gulf of Skalofono in the west up to the Gulf of Vathylakkos in the east. The area encloses all 18 islets located in the region. The island of Fournoi has an extremely convoluted coastline, shaped in part by the flow of streams, some of which are perennial, forming small valleys, numerous small gulfs and headlands. Surrounding islets are characterised by calcareous rocks and steep, as well as low, rocky shores. The small islets are mainly covered by halophytic vegetation, while the larger ones by sparse phrygana, providing ample habitat for nesting and roosting seabirds. Fallen boulders and numerous crevices create burrows, which are used by breeding shearwaters.

The water depth is generally small, the continental shelf gently inclining to reach 290 m in the southern part. The site comprises a refuge for the Mediterranean Monk Seal, a significant population of which breeds here. Dolphins are often seen feeding in the area, such as the Striped Dolphin and the Common Bottle-nosed Dolphin.

Ornithological Importance

This is an important site for all 6 seabird species occurring in Greece. Three species meet IBA criteria, the two shearwater species and the Audouin’s Gull. A large mixed colony of Cory’s and Yelkouan Shearwaters is located on one of the islets, holding an estimated population of 800-1,000 pairs of each
species. These are the third largest colonies for both species on a national scale. The greatest raft count recorded reaches 2,500 individuals on one single evening at a small distance from the colony islet. Both species are frequently observed feeding in the area individually or in large flocks of up to 200 birds. The area holds the second largest breeding population of the Audouin’s Gull in Greece (16-86 pairs), which has been monitored since 1996. The local breeding population has often moved between breeding islets, overall using at least three of them. The population size seems to have declined over the last decade mainly owing to the selection of suboptimal sites to breed due to competition with Yellow-legged Gulls, as well as the increased disturbance occurring at the site.

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<td>A1, B2, C1, C6</td>
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</table>
Other Species of Interest

Other species occurring in the area include the Mediterranean Shag with an estimated population of 30-43 pairs breeding in loose colonies mainly on islets and to a lesser extent along the coastline of the main island of Fourni. Roosts of up to 74 individuals have been recorded on islets during the post-breeding period. Most islets host Yellow-legged Gull colonies, with the local population estimated at 340-490 pairs. European Storm-petrels are often recorded at sea south of Fourni. Their breeding has not been confirmed in the area.
Uses, Threats, Management

The islets are regularly visited by fishermen, local inhabitants as well as livestock breeders and their dogs, who traditionally use the islets. Their presence on the islets, particularly during spring and summer may cause disturbance to the nesting seabirds. When successive visits have occurred during the early stages of the Audouin’s Gull breeding season, poor hatching success has been recorded (e.g. in 1997 an unusually large number of cracked eggs was observed). Furthermore, small buildings have been constructed on three islets hosting significant populations of nesting seabirds. The presence of these constructions has caused local habitat degradation. These buildings are currently not used, however in case of future use, increased human presence may cause significant additional disturbance to the seabird colonies. Disturbance is expected to become even greater in the future as islet accessibility with recreational boats increases. An additional threat to seabird eggs and chicks is the presence of predators on islets, such as rats, which have been accidentally introduced by man, and Yellow-legged Gulls, the population of which has significantly increased due to abundant food sources e.g. fisheries discards.

The wider area around Fournoi comprises important fishing grounds, thus fishing is the main activity on the island. Trawler fisheries are particularly widespread in the area, originating from ports on Ikaria, Samos and the Northern Dodecanese islands. Operation of these fisheries in shallow waters causes the degradation of marine communities. Overfishing has lead to the reduction of fish stocks over the last decades, as reported by local fishermen. Accidental trapping in fishing gear has also been reported in the region especially for seabird species such as the Cory’s and Yelkouan Shearwaters, Audouin’s Gull and Mediterranean Shag. Additionally, small scale aquaculture units operate west of Agios Minas islet, however there is no evidence of their effect on seabirds.

Although marine traffic in close proximity to the islets is relatively high during the summer months, breeding seabirds seem to become tolerant to vessels which pass at regular intervals and routes. The site’s importance for seabirds and other island breeding birds has led to the implementation of a series of survey, monitoring and conservation programmes which have been carried out by HOS during the last 15 years. Additionally, in 2011 rat eradication was implemented on the main seabird colony sites to improve seabird island habitat quality and breeding success.
Site Description

This is an extensive marine site which contains the coastal area around the island of Andros, excluding the part extending from the port of Andros up until the southern arm of Korthi Bay. Overall, 16 islets and rocks are contained within this marine area. The IBA encloses a 0.5 n.m. marine extension which has been delineated around most of the island, along the afore-mentioned sections of Andros and nearby islets.

The coastline is mainly rocky consisting of highly weathered metamorphic rocks (schists), forming eroding cliffs intermittent with numerous sandy beaches with shallow waters. Several perennial streams flow in the area forming small coastal wetlands. Islets are in general low-lying or flat with a smooth relief and are covered by phrygana and halophytic vegetation. The maximum depth in the site does not exceed 130 m. Strong northerly winds blow in the area, especially in the Strait of Kafireas (Kavo Doro) between Andros and Evvoia, thus the site is much preferred by shearwaters. The marine environment surrounding Andros includes important marine habitats, such as Posidonia beds and reefs, which remain in relatively good condition. The area is important for cetaceans, such as the Common Bottle-nosed and Striped Dolphin, while Sperm Whales have been found stranded. The Mediterranean Monk Seal has been recorded in the waters around Andros. The site is adjacent to the island of Gyaros, one of the main breeding areas of this species in Greece.
Ornithological Importance

This marine IBA has been designated for its importance for the Mediterranean Shag which breeds (63–70 pairs) along the coast of the island of Andros and on neighbouring islets. Despite the significant size of the local breeding population, the species does not form large colonies and nesting sites are scattered along the entire coastal area of the IBA. The birds remain dispersed also during the post-breeding season, forming groups of roosting adults and juveniles (normally up to 20 individuals). The shallow waters and sandy bays provide ideal foraging habitat for the species.

<table>
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<th>unit</th>
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<td>63</td>
<td>70</td>
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<td>B3, C6</td>
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</table>
Other Species of Interest

The **Audouin's Gull** occurs in the area mainly during the breeding season, feeding in the shallow waters of northern and eastern Andros. These individuals most probably originate from the breeding colony in the neighbouring southeast Evvoia (GR113). The breeding population of the **Yellow-legged Gull** nesting on uninhabited islets around Andros is estimated at 290-430 pairs. After the end of the breeding season most of the birds leave the area. **Cory’s and Yelkouan Shearwaters** regularly feed in the coastal waters around Andros, however their foraging areas extend beyond the IBA boundaries into the surrounding pelagic waters. Increased congregations of shearwaters have been recorded in the vicinity of the strait between Andros and Tinos islands in the south and of Kafireas Strait in the northwest of the IBA. The latter strait is also considered to function as a Yelkouan Shearwater migratory bottleneck (see GR113). **European Storm-petrels** have been recorded in the coastal waters west of Andros however local fishermen report regular sightings in pelagic areas around the island. No shearwater or storm-petrel colonies have been found in the area, therefore the origin of the afore-mentioned Procellariiformes remains unknown.

Uses, Threats, Management

**Predation of rats on eggs and chicks of the Mediterranean Shag comprises the main threat at its colony sites.** The breeding performance of both the Mediterranean Shag and Audouin’s Gull is further affected by Yellow-legged Gulls which compete for food and nesting sites, and also predate on eggs and chicks. Several seabird colony and roosting sites, as well as foraging areas, are easily accessible, thereby making them particularly susceptible to disturbance caused by increasing human presence.
e.g. recreational activities, fishermen visiting the islets. Fisheries in the area are mainly coastal, consisting of local fishing vessels using nets and longlines. Trawlers and purse seine vessels from the ports of Karystos (Evvoia) and Rafina (Attica) also operate in the area. Seabird breeding success and survival are affected by reduced availability of prey, caused by unsustainable fishing with non-selective methods i.e. trawling and purse seines. Potentially, seabirds are also at risk of accidental trapping in fishing gears i.e. nets and longlines. The impacts of both these threats (reduced fish stocks and seabird bycatch) on the seabird populations in the area remain unknown.

Furthermore, aquaculture units operate in Limanaki Bay on the northwestern side of Andros. Apart from attracting Yellow-legged Gulls and potentially enhancing their populations, fish farms do not seem to have any significant effect on seabirds.

Kafireas Strait is a nodular point upon the main route followed by commercial and passenger vessels travelling to and from the North Aegean Sea, Black Sea and the rest of the Mediterranean Sea. Due to the intense marine traffic, as well as harsh weather conditions usually occurring at the site, marine pollution comprises a potential but significant threat for all seabird species.

Two proposals for wind farms (in total 349MW) have been applied in the region of Andros, which if realised could have negative effects on seabirds: the construction of a wind farm on Gavrionisia islets would cause the destruction of seabird breeding and roosting habitats and the displacement of the local breeding population of the Mediterranean Shag at this species’ most important colony site within the IBA. In addition, the proposal of an offshore wind farm north of Andros is located approximately 1 n.m. from the coast. Although this development would probably not bring about serious impacts for the Mediterranean Shag, it is expected to severely affect Yelkouan Shearwaters which use Kafireas Strait in large numbers.

A LIFE-Nature project is currently being implemented aiming at the establishment of a management plan for the local Special Protection Area (SPA) and to carry out a series of conservation actions for the improvement of terrestrial and marine habitats vital for priority bird species, including the Mediterranean Shag and Audouin’s Gull.
Site Description

The marine area of the IBA is located 4 n.m. northeast of the island of Serifos in the western Cyclades and includes a 0.5 n.m. marine extension around Serifopoula islet. The islet is covered by low vegetation, primarily phrygana, and surrounded by a steep coastline, especially in the south where vertical cliffs overlook the sea. Similarly, the seabed descends abruptly to depths exceeding 150 m thus creating a narrow zone of shallow coastal waters around the islet.

Apart from the importance of Serifopoula islet for seabirds, the surrounding waters also host marine mammals, such as the Mediterranean Monk Seal and Risso’s Dolphin.
Ornithological Importance

The marine area of the IBA consists of the main foraging areas of the *Audouin's Gull* which breeds here. This small but significant colony was first discovered in 2001 and has remained stable since. The species also feeds in the coastal waters of eastern and northern Serifos and Piperi islet, however in lower numbers.

<table>
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Other Species of Interest

The IBA hosts a breeding population of the *Mediterranean Shag* (26 pairs) which nests primarily along the coast of Serifos and nearby islets. The main marine area used by the species is located in the coastal waters along the northern, eastern and southern coast of Serifos. Both *Cory's* and *Yelkouan Shearwaters* are often observed foraging in the pelagic areas surrounding the IBA. Additionally, congregations of up to 200 Cory’s Shearwater individuals have been recorded during afternoon hours in the vicinity of Piperi and Serifopoula islets, suggesting that the species might be breeding in the area, however no colony sites have been found yet. More than 100 pairs of *Yellow-legged Gulls* breed on the islets around Serifos.

Uses, Threats, Management

The islet of Serifopoula is now uninhabited, with a monastery and ruins of a medieval tower. In the past, the abundant terraces were cultivated for cereals while nowadays they are only used for livestock grazing. Since the early 19th century Serifos experienced extensive exploitation of its iron ore deposits, although mining activities were completely abandoned in the 1960s. Nowadays the main economic activities include tourism and agriculture. The most significant threats identified at seabird colonies include human disturbance and predation of eggs and chicks by rats and Yellow-legged Gulls. Additional disturbance and habitat degradation occurs on the coastal zone of Serifos due to tourist development.

The marine area around Serifos is mainly influenced by marine traffic (passenger ships, local tourist vessels and fisheries) primarily associated with Livadi, the main port of Serifos. Additionally, overexploitation of fish stocks resulting in the reduction of seabird prey availability may pose a threat to seabirds foraging in waters around Serifos.
Site Description

This IBA engulfs the whole marine area surrounding Paros island, apart from two stretches of coastline: to the west from Cape Voreino till the southern part of Paroikia port, and to the east from Cape Aspros Gremos till the northern arm of Kefalos Bay. Similarly, the IBA includes the marine zone around Antiparos island, excluding two parts, to the south from Cape Mastichia till Cape Petalida and to the northwest from Sifnaiikos Gyalos Gulf till Cape Kalogeros. The IBA boundary encloses a 0.5 n.m. marine extension over the entire region and a 2.7 n.m. extension in the north of Paros.

The coastal area is in general low-lying with few eroding rocky cliffs, interspersed with sandy beaches and numerous small permanent or seasonal coastal wetlands. The marine area encloses more than 53 islets and rocks occurring in the region. Large islets are covered by sparse maquis shrubland and phrygana, abandoned cultivations on terraces, while certain parts still hold juniper shrublands extending up to the sandy beaches. Smaller islets are mainly covered by phrygana. Human constructions or private houses have been built on some of them.

The marine environment is typically shallow, not exceeding 100 m in depth, with extensive stretches of sandy seafloor and small sheltered coves with Posidonia beds. The site favours marine mammals, including all dolphin species, namely the Striped, Common Bottle-nosed and Short-beaked Common Dolphin, as well as the Mediterranean Monk Seal.
Ornithological Importance

This site is important for the breeding populations of 5 seabird species. The Mediterranean Shag breeds along the rocky coast of Paros and Antiparos but also on most of the surrounding islets. The breeding population numbers 50-65 pairs, with their nesting sites sparsely located along the coast. Post-breeding congregations of up to 65 individuals have been recorded in the coastal waters of Paros and Antiparos.

Breeding of the Audouin’s Gull was first recorded here in 1996 on two uninhabited islets. The breeding population trend was relatively stable up until 2001, however since then the colony size declined drastically, being absent during the last few years.

The reasons for this absence remain unknown, although competition for nesting sites and pray with the Yellow-legged Gull, in association with emigration to other neighbouring breeding populations in “Mikres Kyklades” (GR253) and Mykonos (GR197) is considered most probable.

This is one of the few sites where all three species of Procellariiformes occurring in Greece breed. Mixed colonies of both Cory’s and Yelkouan Shearwaters have been identified on two different islets. The area holds one of the most important Cory’s Shearwater colonies in the Cyclades (100-160 pairs) and a smaller but significant Yelkouan Shearwater population (20-50 pairs). The nesting
A considerably large population of Yellow-legged Gulls (450-700 pairs) breeds on most of the islets of this area. The habitat of these colonies is characterised by weathered cliffs with substantial halophytic vegetation and deep, vertical cracks and crevices created amongst huge fallen boulders. Both species forage in large numbers in the waters surrounding Paros and Antiparos, including the strait between Paros and Naxos. Flocks of several hundred individuals are regularly sighted in the area. In addition to the above, the site also holds the second known colony of the European Storm-petrel in Greece (10-15 pairs), discovered in 2012 (see GR114). Till now the species had been frequently observed in the wider marine area around Paros, mainly as sightings of foraging adult individuals.

### Other Species of Interest

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Cory’s Shearwater (Calonectris diomedea)
Paros is one of the main tourist destinations in the Cyclades. Uncontrolled tourism and summer-home development have drastically altered the coastal zone. Growing disturbance caused by intense human presence and the increasing number of leisure boats visiting the islets and inaccessible shores comprises a serious threat for nesting seabirds. These are additionally affected from predation by native avian predators, such as the Peregrine Falcon, Hooded Crow and Yellow-legged Gull, and introduced mammals i.e. rats. The latter was addressed in 2012 through a series of rat eradication operations implemented on 6 uninhabited islets hosting seabird colonies within the framework of the current LIFE-Nature project.

The Local Power Plant is situated on the coast of the Bay of Naousa and operates on diesel fuel. Potential marine pollution could arise during refueling or through the leakage of lubricants, as was the case in 2003. The marine area around Paros, and particularly the Bays of Paroikia and Naousa where the main ports are located, receives intense marine traffic from hundreds of passenger, commercial and tourist vessels mostly during the tourist season. This situation creates a considerable risk of marine pollution due to marine accidents, such as the one which occurred on Portes islets in 2000 just outside the port of Paros. The level of chemical pollution and its effects on the Audouin’s Gull has been assessed in the past. Mercury levels in Audouin’s Gull chick feathers were found to be the highest among colonies sampled in the Northern Dodecanese, Cyclades and Kythira, however still lower than those recorded in the Western Mediterranean Sea. Additionally, PCB levels in unhatched eggs were also found to be lower than toxic levels.

Accidental trapping in nets and longlines poses another threat for seabirds at sea, mainly for the Mediterranean Shag, Audouin’s Gull and the shearwaters.
Site Description

Located at the southernmost tip of the Cyclades, this site includes the marine area surrounding the islet Makra and the eastern part of islet Pacheia, south of Anafi island. The islets are characterised by rugged rocky coastline and phrygana vegetation, with vertical cliffs and multiple locations with fallen boulders and scree, ideal for nesting seabirds. The waters between Anafi and its islets are relatively shallow, while to the south of these islets, the seabed falls abruptly to depths reaching up to 600 m. Strong westerly currents predominate in the area. Mediterranean Monk Seals have been recorded in the area.
Ornithological Importance

The site holds an important colony of Cory’s Shearwater, the largest one in the Cyclades and the fifth overall in Greece. The species finds here suitable nesting habitats with numerous crevices and soft substrate. Hundreds of birds can be seen during the summer months foraging and rafting particularly in the marine area between Anafi island and its neighbouring islets to the south, as well as between Anafi and Santorini islands. Further surveys are required to delineate Cory’s Shearwater foraging areas around Anafi.

<table>
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Other Species of Interest

The Mediterranean Shag is the other species of importance in the area. It breeds along the coast of Anafi island and on the islets to the south, forming small colonies or individual nests. The species feeds within surrounding coastal waters and numerous small shallow bays. The population is estimated at 20-30 breeding pairs. A small colony of Audouins Gulls (5-10 pairs) occasionally breeds on the uninhabited islets in the IBA. Individual birds are frequently seen feeding along the southern waters of Anafi. A small population of Yellow-legged Gulls breeds on the islets (75-100 pairs). Yelkouan Shearwaters also occasionally feed in the area.

Uses, Threats, Management

Rat predation on eggs and chicks is considered to be the main threat for seabirds at their nesting sites. Predation and competition for food and nesting sites by Yellow-legged Gulls potentially affect the breeding performance of the Mediterranean Shag and Audouin’s Gull, while rabbits may also interfere with the breeding colony of Cory’s Shearwaters through the occupation of their nesting burrows. Seabird breeding habitats will be irreversibly damaged if plans to install a large wind farm (300 MW) on the islets of Pacheia and Makra are realised. Human presence, particularly on uninhabited islets causes disturbance at seabird colonies. Human activities in the marine area around Anafi are limited, and relate primarily with recreational tourist activities and fisheries. Accidental trapping of shearwaters in longlines has been reported in the area however further surveys are required to evaluate the severity of this threat.
Site Description

This IBA includes the marine area surrounding the islands of Arkioi, Leipsoi, Leros and Agathonisi, as well as their neighbouring islets. The site contains a 0.5 n.m. marine extension all around the aforementioned islands, with an additional 2.7 n.m. extension surrounding eastern Leipsoi and western Arkioi islands. More than 70 uninhabited islets and rocks create an intricate continuous archipelago with shallow water, ideal for seabird foraging and resting. Most islets are low-lying or flat with a smooth relief and are covered by phrygana and halophytic vegetation, while at some parts the coastline exhibits low-lying weathered sandstone cliffs, providing suitable nesting habitat for seabirds and some raptor species. Remnants of small coastal wetlands occur on all four large islands with most significant those on Leros. The waters surrounding the Northern Dodecanese islands are important for marine mammals. All three species of dolphins have been recorded here (Striped, Common Bottle-nosed and Short-beaked Common Dolphin), as well as a significant resident population of Mediterranean Monk Seals.

Ornithological Importance

The IBA has been designated for its importance for 4 breeding seabird species. It holds the largest breeding population of the Audouin’s Gull in Greece, occurring in two main colonies with recorded population exchange. The breeding population trend exhibits a slight decline over the last 15 years. The area provides numerous suitable nesting sites and 14 islets in total have been used for nesting. Breeding birds feed primarily in the coastal waters around the islands, generally up to 6-7 n.m. away from colony sites, however occasionally they fly as far as 40 n.m. away to feed in the coastal waters of Turkey. During the non-breeding season the birds disperse throughout the Mediterranean Sea, from Cyprus in the east, to Libya in the south. Due to their importance on a national scale, the Audouin’s Gull colonies of the Northern Dodecanese have been the subject of the species’ longest HOS monitoring scheme which started in 1995 and includes extensive monitoring of breeding performance, ringing and telemetry.

The site also holds the largest breeding population of Yelkouan Shearwaters nationally, and a smaller but significant breeding population of Cory’s Shearwaters. These shearwaters breed at several colony sites on uninhabited islets in the area. Flocks of both species are frequently seen foraging during the breeding season within the entire marine area of the IBA, while large rafts are often observed in the vicinity of their colonies. This IBA together with the neighbouring one on Fournoi GR144) constitute the main Yelkouan Shearwater stronghold in Greece. As was to be expected, the surrounding shallow waters between Samos, Ikaria, Patmos, Kalymnos and Turkey with depths up to 100 m above the continental shelf comprise one of the main shearwater foraging grounds in the Aegean Sea. Flocks of foraging Yelkouan and Cory’s...
Shearwaters consisting of several tens up to several hundred individuals are regularly recorded in this greater marine region. Their foraging areas extend far beyond the boundaries of the corresponding IBAs and are thought to reach as far as the Turkish territorial waters. Additional systematic boat-based and telemetry surveys are required to delineate the boundaries of this shearwater foraging area.

The IBA also hosts a significant breeding population of the Mediterranean Shag. Their nesting sites are dispersed along the coast of most islets and inaccessible cliffs of some of the inhabited islands, mainly forming small colonies, while some islets host relatively large post-breeding congregations. Respective foraging areas include all coastal waters in the IBA.

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<td>102</td>
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<td>good</td>
<td>A1, B2, C1, C6</td>
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Shearwaters consisting of several tens up to several hundred individuals are regularly recorded in this greater marine region. Their foraging areas extend far beyond the boundaries of the corresponding IBAs and are thought to reach as far as the Turkish territorial waters. Additional systematic boat-based and telemetry surveys are required to delineate the boundaries of this shearwater foraging area.

The IBA also hosts a significant breeding population of the Mediterranean Shag. Their nesting sites are dispersed along the coast of most islets and inaccessible cliffs of some of the inhabited islands, mainly forming small colonies, while some islets host relatively large post-breeding congregations. Respective foraging areas include all coastal waters in the IBA.
In general, this is an area receiving low human pressure. Low intensity tourism has been developing in the area, however the number of vessels (speed and sailing boats) accessing the islets for leisure is increasing. Disturbance is the main threat at breeding colonies caused by the presence of visitors, although often the steep and rugged relief of the islets impedes disembarkation on certain parts of the coastline. Another important threat for breeding species is predation of eggs and chicks by predators such as rats, Yellow-legged Gulls and Hooded Crows. An uncontrolled rubbish dump still operates today on the southwest coast of Leros, discarding raw waste on the underlying slope, eventually reaching the sea. The operation of a new waste treatment plant and landfill in Leipsoi has replaced the old rubbish dump, which is expected in the long-term to lead to the decline of the local Yellow-legged Gull population. Coastal development has been increasing during the last two decades, mainly related to tourist infrastructures and the construction of summer housing, although it is still considered to be of low intensity. Military exercises are practised on an islet at the north of Leros, at close proximity to one of the

**Other Species of Interest**

Individuals or flocks of **European Storm-petrels** are regularly sighted during the breeding season in coastal and pelagic waters around the islands of the Northern Dodecanese, however breeding of the species in the area has yet to be confirmed. **Yellow-legged Gulls** (750-1,100 pairs) breed on almost all islets in the region. The majority of birds leave the area during the post-breeding period.

**Uses, Threats, Management**

![Audouin's Gull](Larus-audouinii)
Audouin's Gulls colonies, which leads to disturbance to breeding birds and habitat degradation. Ports exist on all four inhabited islands, Laki port in Leros being the largest and with the greatest human presence. Marine traffic is mostly limited to local passenger boats and few ferry lines, especially from May till October. Thus, the risk of marine pollution from this source is not considered to be high. The predominant activity occurring in this marine IBA is coastal fisheries mainly practised by local small fishing boats using nets and longlines, but larger trawler and purse seine vessels from adjacent islands, such as Kalymnos, Patmos and Samos also fish intensely in the area. Small scale aquacultures operate, especially on Agathonisi and Leros. Maintenance infrastructures (huts, piers, lighting, etc.) are often constructed upon islets, thus degrading nesting, roosting and foraging habitats for seabirds, in addition to increased disturbance caused by human presence. The only aquaculture unit operating in northwest Leipsoi has recently been removed. Accidental trapping of Audouin's Gulls and Cory's Shearwaters in small-scale longline fisheries has been recorded in the region. The decline of fish stocks due to intensive trawler and purse seine fishing comprises a potential threat for all seabird species in the region which requires further assessment.
Site Description
This marine IBA includes all coastal waters surrounding the western, southern and southeastern Kalymnos island, extending up to the western coast of Pserimos island. The marine IBA excludes the northeastern part of Kalymnos coastline from Petronda Bay until Pezonda Bay. The boundary contains a 0.5 n.m. marine extension and encloses 12 islets, as well as the inhabited island of Telendos. The coastline of Kalymnos and Telendos is typically rocky, with impressive vertical limestone faces and coastal cliffs, covered by chasmophytic and phryganic, intensively grazed vegetation. Apart from the islets of Agia Kyriaki and Nera which have been afforested with pine plantations, the remaining islets are low-lying, exhibiting sparse shrubland and phrygana, suitable for nesting seabirds. Although coastal waters in the region have been overfished for decades, the site still comprises very important fishing grounds, characterised by deep waters to the west and strong currents. Mediterranean Monk Seals are present within the area.

Ornithological Importance
The IBA includes marine areas which are important foraging and resting areas for the Audouin’s Gull which breeds here. Its colony is formed by a small but relatively stable population which was first identified in 1997. The birds have been recorded to breed on 5 different islets in the area. The breeding population size has declined over the last 3 years. The IBA includes marine areas which are important foraging and resting areas for the Audouin’s Gull which breeds here. Its colony is formed by a small but relatively stable population which was first identified in 1997. The birds have been recorded to breed on 5 different islets in the area. The breeding population size has declined over the last 3 years.

Other Species of Interest
All remaining common seabird species occur in this area. A small population of the Mediterranean Shag (11-35 pairs) also breeds in the area, nests being sparsely situated on the rocky coast of Kalymnos and on a number of nearby islets. The species is resident all year round, forming larger flocks during the post-breeding season when individuals gather from the surrounding coastal areas. The site constitutes an important foraging area for large flocks of Cory’s and Yelkouan Shearwaters (up to 1,200 and 400 individuals counted, respectively), although breeding of these species has not been confirmed. Thus the boundaries of the IBA are expected to be extended in the future to incorporate shearwater foraging areas. Yellow-legged Gulls breed on the islets. Their population is estimated at 250-420 pairs.

Uses, Threats, Management

Kalymnos is one of the most populated islands of the Dodecanese and an important domestic tourist destination. For centuries, the island has depended on the fisheries sector, possessing one of the largest fishing fleets in Greece which consists of both small-scale and medium fisheries. This has led to the
overfishing of the surrounding coastal waters. Illegal fishing techniques are still commonly practiced, such as dynamite fishing and fishing using scuba gear. Thus, the most significant threat relating to the Audouin's Gull, as well as other seabirds is the decline in prey availability leading to reduced reproductive success and low chick survival. Bycatch of Cory's Shearwaters in longlines has been evidenced in the area. Although not considered common, accidental trapping in longlines and nets poses a threat to seabirds which requires further assessment.

The most significant threat on seabird breeding colonies relates to the presence of rats and pet mammals which have been introduced to islets resulting in predation of chicks and eggs or even overall colony abandonment. In addition to this, disturbance induced by visitors, livestock breeders and fishermen has also been recorded as a threat. Daily tourist boat cruises during summer include islet visits and two out of five Audouin's Gulls breeding islets also host small churches which are regularly used by locals. Moreover, negative effects on the breeding success of seabird and raptor species nesting on cliffs may be caused by the considerable growth of climbing activities on the cliffs of Kalymnos and Telendos. Aquaculture units are located mainly in Emboreio (NW) and Chali (SE) Bays, causing local marine pollution. Maintenance infrastructures constructed on islets lead to habitat degradation, while frequent human presence during fish farm operation cause disturbance to breeding seabirds.
This IBA includes the marine area surrounding an islet chain located within the Ikarian Sea between Amorgos and Leros islands, joining up the Cyclades and the Dodecanese. The boundary contains a marine extension of 0.5 n.m. which engulfs the islands of Kinaros and Levitha, and their adjacent eight small islets. The coastal area of Kinaros island is characterised by impressive vertical cliffs reaching more than 100 m height, with numerous fjord-like coves, while Levitha has a lower-lying rocky coastline with a central lowland grassland still extensively cultivated. The uninhabited islets are mainly rocky and covered by phrygana, some exhibiting also diverse coastal habitats, such as the miniature calderas on Mavra islets. The marine environment of the IBA is characterised by a narrow continental shelf falling abruptly to depths up to 400 m. During the summer and winter months the coastal zone is greatly affected by strong northerly and northwesterly winds. The area has been recognised as one of the hotspots of marine productivity which in the Aegean Sea is primarily influenced by the Etesian (meltemi) winds causing upwellings. Thus the area is also important for marine mammals, such as the Striped and Common Bottle-nosed Dolphin, as well as for the Mediterranean Monk Seal.
Ornithological Importance

The Audouin's Gull colony (40 pairs) was first recorded here in 1995. The breeding population regularly alternates colony site between years and has nested on 4 out of the 8 islets present in the area. The population size remains till today small but stable, although the species does not seem to breed in the area every year. In years when the population size has been low in the area, or no colony has been found, a moderately large colony has been located in western Amorgos (GR156 and marine IBA GR253), more than 20 n.m. southwest of the site. This suggests that the breeding population of these two sites probably interchange. During the breeding season birds forage primarily in the coastal waters surrounding their colony sites, however their feeding range increases during the post-breeding period when Audouin's Gulls are regularly observed foraging along the northern and northeastern coast of Amorgos to the west of the site.

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Other Species of Interest

Nesting sites of a small resident population of Mediterranean Shags (4-8 pairs) are dispersed in the area along the rocky coast of uninhabited islets. The species foraging areas coincide with those of the Audouin's Gull, including waters along the northeastern coast of Amorgos. Flocks of foraging Yelkouan and Cory's Shearwaters (up to 200 and 250 individuals) have been recorded in the area during their breeding season. Due to the remoteness of the site, research in the area has been fairly limited and therefore further surveys are needed to assess the importance of the wider marine area around Kinaros and Levitha for shearwaters.

A significant number of European Storm-petrels (12 individuals) was recently recorded east from Levitha island, although breeding has not been confirmed. Foraging individuals are seldom seen in the greater marine area.

The Yellow-legged Gull population is relatively small (60-70 pairs). Breeding has been recorded on all islets.

Uses, Threats, Management

The islands of Kinaros and Levitha had small settlements in the past, although nowadays they are only inhabited by one family each, mainly occupied with livestock breeding and fishing. This relatively remote and inaccessible marine area constitutes an important fishing ground. Thus, coastal fishing vessels visit the area regularly and overnight or seek refuge in coves and islets during a surge of bad weather. Seabird colonies which happen to be located close to their mooring site, experience localised but intense disturbance. Abandonment or breeding failure of Audouin's Gull colonies have been caused by prolonged human presence during particular years in the past. The predation of eggs and chicks by rats and Yellow-legged Gulls has also been recorded as a threat, especially relevant to Audouin's Gulls nesting islets. Particularly in 1997, all eggs in the colony were found predated. Additionally, it has been suggested by locals that rat populations have increased and have also been responsible for the decline of the large Eleonora's Falcon colony on Kinaros island. A large wind farm (132 MW) is planned to be constructed on the islands of Kinaros and Levitha, as well as on the islets of Glaros and Liadia. If these installations are carried out they will have devastating effects on the breeding populations of both trigger species of the terrestrial IBA, the Audouin's Gull and the Eleonora's Falcon, since their nesting habitat will be destroyed beyond recovery.

Significant commercial marine traffic between the North Aegean Sea and Southeast Mediterranean Sea occurs in the wider marine area surrounding the sites, thus introducing a threat of marine pollution. Seabird bycatch poses a potential threat which requires assessment.
Site Description

The marine part of this IBA includes the coastal waters of Astypalaia island and its surrounding islets, excluding two parts: the eastern coast extending from Cape Flouda in the northern-most tip of the island until 0.7 n.m. south from Cape Trypiti and the south coast of the island from the southwestern Cape Tyliakos to Cape Ehieli in the southeast. The area encloses a 0.5 n.m. marine extension around most of the island and a 2.7 n.m. extension in the southeast.

Marine habitats such as Posidonia beds, the sublittoral rocky seafloor and the sea inlets are well conserved here. The coastline of Astypalaia is characterised by cliffs and rocky shores covered by overgrazed phrygana and maquis. Numerous rugged valleys lead to interspersed small sandy beaches, where natural coastal wetlands often occur, with most important the salt marshes of Vathy, Panormos and Marmari Gulfs. Small islets are generally low-lying with relatively smooth slopes covered by phrygana and halophytic vegetation. Larger islets, such as Ophidousa and Pontikousa, have steep and high cliffs with degraded maquis vegetation, while on some there are abandoned structures, such as livestock pens, terraced fields and dry stone walls.

The seabed descends abruptly from the coastline reaching depths up to 300 m southeast of Koumoupo islets and 200 m west of Ofidousa islet. Relatively shallow waters however occur, particularly in proximity to the islets in the two large gulfs of Astypalaia, facing northwest and southeast, where seabirds forage. The IBA includes vital foraging and rafting areas for the local population of seabirds during the breeding season. In addition, partly submerged sea caves provide shelter to a significant population of the Mediterranean Monk Seal. Dolphin species, such as the Striped and Common Bottlenosed Dolphin, as well as the Loggerhead and Green Turtles have also been recorded in the area.

Ornithological Importance

The area holds a small but significant colony of the Audouin's Gull (2-25 pairs) the size of which reached a peak in 1999. Recent records suggest the breeding population in the area has declined. Audouin's Gulls have been using 5 different islets in this area for nesting. The species forages in the north within the gulfs of Vagi and Vathy near Fokionisia islets, in the southeast amongst the shallow waters of the islets, in Agios Fokas Gulf, as well as in the coastal waters of the larger western islets. A small breeding population of Yelkouan Shearwaters (40-60 pairs) occurs in the area, with colonies confirmed on at least two islets. Flocks of up to 330 individuals have been recorded foraging in the wider marine area, primarily during the breeding season, occasionally also following trawlers.

Other Species of Interest

Foraging Cory's Shearwaters are also common in the area although breeding has not been certified yet. In addition, 14-25 pairs of Mediterranean Shag breed mainly on islets. This resident population forages and rests within the entire coastal marine area of Astypalaia and nearby islets all year round. Individual European Storm-petrels have been recorded 3 n.m. south from the marine IBA's area. Colonies of the Yellow-legged Gull are located on islets surrounding Astypalaia with its breeding population exceeding 50 pairs.
Uses, Threats, Management

Human disturbance at seabird colonies relates mainly to the breeding Audouin’s Gulls. This risk is a cause of concern as the frequency of visits to islets has increased over the years, either by tourists, or by fishermen and local livestock breeders. Predation of eggs and chicks, and even adult birds is another threat that has been recorded which is caused mainly by natural predators such as Peregrine Falcons, but also Yellow-legged Gulls and Hooded Crows. In the past the colony has been predated intensively by Peregrine Falcons, leading to the complete breeding failure of the colony.

Seabird bycatch and reduction of food sources are the main threats for seabirds at sea. Accidental trapping of Audouin’s Gulls in longlines was already reported back in 1990’s. Non-selective fishing practices, such as trawlers and purse seine, comprises a threat for all seabirds in the area, which may lead to the decline of local fish stocks in the long-term. Fish farms operate in Agios Fokas Bay, potentially leading to the local degradation of Posidonia beds. Marine traffic occurs mainly to the east of the site, between Astypalaia and Kos islands, and poses a potential source of marine pollution.

A medium-sized wind farm (168 MW) has been planned on 4 large islets in the area. This proposal potentially comprises a very significant threat for all seabirds breeding on them, since construction works would degrade or even destroy their nesting habitats. During operation, wind turbines and artificial lighting may cause disturbance or disorientation of returning Yelkouan Shearwaters at night and even seabird mortality through collisions.
Site Description
The marine part of this IBA contains a 0.5 n.m. marine extension surrounding the entire island of Tilos, including the large islets of Antitilos in the southeast and Gaidaros in the northwest, as well as 10 smaller islets. The coastline of Tilos is characterised mainly by moderate rocky shores and eroding cliffs covered by phrygana and maquis vegetation. The continental shelf is narrow, falling abruptly to large depths, reaching a maximum of 400 m to the southeastern coast of Antitilos islet. The islet’s steep cliffs are more than 100 m in height providing suitable sites for breeding seabirds and raptors. Shallow waters which occur within the gulfs of Agios Antonios, Eristos and Livadia maintain Posidonia beds and are preferred by foraging and resting seabirds. Another important marine species occurring in Tilos is the Mediterranean Monk Seal.

Ornithological Importance
A small, but locally important Audouin’s Gull breeding population (7-29 pairs) occurs here, which was first identified in 1997. Colony size seems to have declined substantially although more studies are required to reach a conclusion. Interannual fluctuations of the breeding numbers may be influenced by the interchange of individuals with neighbouring populations on Symi and Chalki islands (GR169 and GR170). In the past, hatching success has been found to be very low, while predation of chicks by Peregrine Falcons has also been recorded.

A breeding population of the Mediterranean Shag (20-30 pairs) occurs in the area, with nests dispersed along the coast of Tilos and Antitilos, as well as a few surrounding islets. During the non-breeding season only part of the population (up to 37 individuals) remains in the area. The birds are found foraging in coastal waters along the entire coast of the site. Yelkouan and Cory’s Shearwaters are often seen foraging in flocks in the Bay of Agios Antonios in the north and around Antitilos islet in the south. Shearwater breeding is suspected, however no colonies have been found yet in the area.

Other Species of Interest

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<td>A1, C1</td>
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Uses, Threats, Management
Human pressure which could affect seabirds within the marine IBA is in general low. Since 1993, the island authorities have supported the prohibition of hunting in the area and have promoted sustainable...
development. Thus, Tilos has become a significant ecotourist destination, providing activities which promote nature conservation. The port of Livadia receives few ferry lines which connect the island mainly with Rhodes and the rest of the southern Dodecanese. Few local sightseeing tours also operate, mostly limited to the tourist season from May till October. The main shipping routes passing though the area of the southern Dodecanese are located to the north, along the Turkish coast and to the south towards the strait between Rhodes and Karpathos islands. Therefore, marine pollution is not regarded as a significant issue. An important threat for seabirds as well as other species breeding on the islets (e.g. Eleonora’s Falcon) is the predation of eggs and chicks by rats and avian species such as Peregrine Falcons, Yellow-legged Gulls and Hooded Crows. Disturbance on islets is not considered significant due to low levels of human presence and the steep relief of the islets, which does not facilitate disembarkation.

Coastal fisheries are quite widespread, mainly involving local fishing boats using nets and longlines, but also fishermen from other surrounding islands such as Symi, Chalki and Nisyros. Larger trawler and purse seine vessels operate in the area from Rhodes and Kos. According to local fishermen, fish stocks have declined due to overfishing by these medium-sized fisheries. Incidental trapping of Mediterranean Shags in fishing gear has also been reported, especially when nets are placed close to the coast.
Symi island and surrounding islets

27° 48' 26.835" E, 36° 33' 22.125" N
Region: Notio Aigaio • Prefecture: Dodekanisa
Area: 76 km²

A1, B2, C1, C6

Site Description

The island of Symi in the southern Dodecanese is located in the vicinity of mainland Turkey, between Datça and Bozburun Peninsulas. The marine IBA includes coastal areas of west, south and eastern Symi, extending from Cape Saros (Toli) in the northwest until Cape Manous in the east. The area contains a 0.5 n.m. marine extension surrounding 10 islets which form two groups, locally known as Diavates in the southwest and Sesklia in the southeast.

This coastal part of Symi is characterised by low and medium rocky cliffs covered by sparse phrygana, some slopes with scree reaching up to the sea, and small pebbled beaches. Most islets are rocky, forming crevices and small cliffs, ideal for nesting gulls and the Mediterranean Shag. Despite of its proximity to the mainland (<4 n.m.), the depth of the separating waters exceeds 200 m. The seabed falls abruptly around the entire island, reaching a depth of 400 m in the south and west. Shallow waters among the small islet groups in the southeast and southwest provide suitable foraging grounds for most seabird species, as well as all three dolphin species (Striped, Common Bottle-nosed and Short-beaked Common Dolphin) and the Mediterranean Monk Seal.

Ornithological Importance

The site holds the most important Audouin’s Gull breeding population in the southern Dodecanese and the third largest nationally after those in the Northern Dodecanese (GR160) and Fournoi (GR144). In the past (1998-9) the colony had reached over 70 breeding pairs, but has declined since then to half the size within a decade, following the trend of most other colonies in Greece. The reasons for this decline are not well understood and require further study. Foraging ranges extend more than 10 n.m. from the breeding colony, with birds feeding in the shallow waters around Diavates, in the Strait of Sesklia, the southern bays of Symi and within the Gulf of Panormitis. Ringing of fledglings has taken place here during 1999 and 2012. A fledgling ringed in the area has been reported breeding 12 years later on a Turkish islet, 14 n.m. from its natal islet. Some individuals overwinter in the area.

Other Species of Interest

Cory’s and Yelkouan Shearwaters are also observed in the area foraging in small-sized flocks, primarily in waters towards Rhodes and Turkey. No breeding colonies of either species have been located yet in the area, although fishermen have mentioned hearing their calls on certain islets at night. A small population of Mediterranean Shag also breeds in the area, while few nesting sites have been identified. The species mainly forages in the Gulf of Agios Vasileios and near Sesklio islet. The Yellow-legged Gull population is relatively small (100-110 pairs), nesting on most islets of the area.

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<td>73</td>
<td>P</td>
<td>good</td>
<td>A1, B2, C1, C6</td>
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</table>
**Uses, Threats, Management**

The main threat to seabirds at breeding colonies primarily includes disturbance caused by the presence of tourists on the islets. Seskli islet located in the southeast used to be inhabited in the past, however nowadays is still often visited by livestock breeders and farmers, but also tourists since it hosts one of the few sandy beaches in the area. The island is an important tourist destination, with numerous boat trips of all kinds between Symi, Rhodes, the rest of the Dodecanese and the Turkish coast. Although Symi port is located outside the marine IBA, a very large amount of the summer tourist flow passes through on its way to the Bay of Panormitis, while visiting the renowned monastery.

With respect to its fisheries, the island possesses an important fleet of small fishing boats, most using nets and longlines, although many target the Narwal Shrimp caught with pots in the sandy parts of the seafloor which occur in the large gulfs of the island. The main threat to seabirds in the marine area comprises the reduction of fish stocks due to intensive fisheries and the use of illegal fishing methods, such as dynamite fishing which is still widely used in this region. In addition, rare incidents of trapping of shearwaters and Mediterranean Shags in fishing gear (longlines and nets respectively) has been reported by fishermen. Considerable marine traffic occurs to the south of the site in the Strait of Rhodes, located between Rhodes and Turkey, thus posing a risk of marine pollution.
Site Description

This is a large marine IBA including the entire coastal area surrounding Chalki island, Alimia islet and the western coast of Rhodes island from Cape Pountakia until Cape Kassaro and Plaka Bay. The site contains a 0.5 n.m. marine extension which engulfs more than 20 small uninhabited islets. The coastline of Chalki is convoluted and rocky, fringed with small bays and few beaches and covered by sparse phryganic vegetation. On the coast of Rhodes there are small coastal wetlands created by the outfall of the seasonal streams of Kalamia, Mandriko and Liros, as well as the Amartos marsh opposite Makri.
islet. Posidonia beds and reefs are abundant in these coastal waters. Within the Bay of Alimia there is a saline-brackish marsh surrounded by juniper shrubland which grows on sand dunes, one of the few examples of an islet coastal wetland in Greece. The archipelago of small islets provides extensive shallow waters extending up to the coast of Rhodes, where seabirds forage. The surrounding marine area however is deep with the seafloor descending abruptly to several hundred meters. Strong currents prevail in the area. The site is also important for the Striped and Common Bottle-nosed Dolphins, the Cuvier’s Beaked Whale and the Mediterranean Monk Seal.

**Ornithological Importance**

The IBA has been designated for the breeding population of the Audouin’s Gull which is among the largest in Greece. Data collected by boat-based surveys and telemetry indicate that birds often forage within a 5 n.m. radius around their colony site. The population has nested on 5 different islets in the area and ringing recovery data suggest that population exchange occurs with other colonies in the region, such as Symi (GR169) and Tilos (GR168) islands. Despite its considerable colony size (18-53 pairs), breeding success has often been found to be low (1997-99), mainly due to predation from raptors, probably Long-legged Buzzards which breed on a nearby islet. Population size has declined over the last decade, as in many other breeding sites around Greece, but not significantly.

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**Other Species of Interest**

The site hosts a small resident population of the Mediterranean Shag which breeds on a few of the islets in the area. Individuals disperse around the entire marine area of the IBA in search of food in shallow waters and to roost. A breeding population of the Yelkouan Shearwater has also been found here, although further surveys are required to estimate the colony size. Small groups of more than 25 individuals have been counted rafting off the coast of the potential colony islet, however fishermen report larger numbers. The species is frequently recorded feeding in small flocks in the marine area between the northern and southern islet groups and along the western coast of Rhodes. Cory’s Shearwaters are also commonly observed foraging here, although breeding has not been confirmed. Yellow-legged Gulls breed on islets in the area (200-260 pairs), competing with other gulls for nesting space.

**Uses, Threats, Management**

Kameiros Skala is one of the most important fishing ports in the greater area, where many tourist and fishing boats dock to refuel and unload. The presence of coastal fisheries is very prominent in the area, with Chalki port being full of small local fishing vessels, mostly using nets, longlines and pots, as well as trawlers and purse seiners. Three aquaculture units operate within the site, one on Chalki and two on the islets Makry and Stroggyli, just opposite the coast of Rhodes. According to local fishermen, overfishing and illegal fishing methods have led to the decline of fish stocks locally. Accidental trapping of seabirds has been reported to occur in the area but rarely so. Increasing human presence on and around islets may lead to disturbance which affects the breeding success of nesting seabirds. Additionally, amateur fishing is a very common activity that takes place in the vicinity of the islets used by seabirds for nesting and resting. The location of Kameiros Skala port close by and the increased marine traffic between Chalki and Rhodes as well as Turkey, places the area at significant risk of marine pollution or marine accidents. Plans to construct a large hotel unit on Alimia have currently been postponed. Extensive touristic development and the construction of aquaculture maintenance infrastructures on islets may irreversibly degrade the existing habitats and potentially deter seabirds from breeding on them.
Kasos island and surrounding islets

26° 52' 44.425" E, 35° 24' 58.228" N
Area: 100 km²
Region: Notio Aigaio • Prefecture: Dodekanisa

Site Description

Kasos island is the southernmost island of the Dodecanese, lying between the islands of Crete and Karpathos along the eastern part of the Hellenic Trench (Pliny Trench). The IBA includes the marine area along the north and western part of the island from Cape Deiktis in the north until Cape Trapeza in the south. The boundary contains a 0.5 n.m. marine extension which encloses all 20 surrounding uninhabited islets, jointly known as Kasonisia, of which Armathia islet is the largest.

The coastline of Kasos is steep with rocky shores, covered by severely degraded maquis and phrygana due to overgrazing, and interspersed small pebbled beaches. Armathia islet is surrounded by shallow waters and hosts a perennial saline coastal wetland and sandy beaches. In the past, the islet was inhabited and mined for gypsum. The remaining Kasonisia islets are characterised by low-lying coastal cliffs and halophytic vegetation.

The marine area between Kasonisia and Kasos is shallow, generally not exceeding depths of 50 m, thus favouring the development of Posidonia beds. The continental shelf to the north of Kasonisia is narrow and drops abruptly to depths of several hundred meters. Similarly, deep waters surrounding the site continue into the Strait of Kasos, located west of the IBA between Kasos and Crete, which is the deepest connection between the Aegean Sea and the Eastern Mediterranean Sea with the main channel being c. 1,000 m deep. Strong west-northwesterly etesian winds and rough sea caused by them are common, particularly during the summer months. Strong currents also occur in the strait between Kasos and Karpathos.

The island complex of Karpathos and Kasos is one of the main Mediterranean Monk Seal breeding areas in Greece and the most important in the Dodecanese. Sightings of cetaceans are also frequent, including the Fin and Sperm Whales, the Risso’s Dolphin, as well as the Striped and Common Bottle-nosed Dolphins.

Ornithological Importance

The second largest Audouin’s Gull breeding population in the southern Dodecanese occurs here (30-63 pairs). The species main foraging areas include shallow coastal waters surrounding the islets.

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<td>good</td>
<td>A1, C1</td>
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</tbody>
</table>

Other Species of Interest

The Mediterranean Shag is resident in the area throughout the year, with an estimated population of 30 pairs breeding on the small islets close to Armathia.

Mixed flocks of Cory’s and Yelkouan Shearwaters have been recorded foraging here (>100 individuals), particularly in the shallower waters surrounding Kasos and the strait between Kasos and Karpathos.

Breeding of Cory’s Shearwaters is suspected in the area, however no colony has been identified yet. Additionally, telemetry surveys have revealed that the marine area around Kasos is used for foraging by Cory’s Shearwaters breeding on Dionysades islets (GR192), more than 30 n.m. to the west beyond the Strait of Kasos.

Uses, Threats, Management

The beaches of Armathia comprise an important tourist attraction receiving thousands of visitors every year. Thus, during the summer months, human presence and subsequent disturbance to breeding...
seabirds on Kasonisia is greatly increased. In addition, Kasos is renowned for its fishing grounds. Illegal fishing practices, such as the use of dynamite, as well as overfishing have led to the decline of fish stocks, which inevitably affects seabird populations foraging and breeding in the area. Apart from its important local fishing fleet, the area is considered a favourite destination for amateur fishing activities. Predation of eggs and chicks by rats is an important threat for seabird colonies, while raptors have been recorded to predate Audouin's Gull chicks in the past. A 350 MW offshore wind farm has been planned for the marine area between Kasos and Kasonisia and also north of Makronisi islet. The area of the proposed wind farm overlaps with the greatest part of the shallow waters where seabirds forage. Thus, the installation and operation of wind turbines would severely degrade the quality of seabird foraging habitats mainly for the Audouin's Gulls and Mediterranean Shags which feed in coastal waters. The wider area of Kasos and Karpathos is highly affected by intense marine traffic passing through the southern Dodecanese, particularly along the shipping route which traverses the Strait of Karpathos between Karpathos and Rhodes. The risk of marine pollution and accidents is further enhanced by strong currents which would disperse pollution over larger areas.
Site Description

The marine IBA contains waters around Agria Gramvousa and Imeri Gramvousa islets, as well as the northern part of Gramvousa Peninsula, surrounding Cape Vouxa and mounts Tripiti and Oura. The islets are covered mainly by phrygana. Imeri Gramvousa possesses important ruins of a well preserved Venetian castle. Steep coastal slopes with fallen rocks, which create numerous crevices, provide suitable nesting sites for colonial seabirds and raptors. The marine area in proximity to western Crete along the Hellenic Trench is regularly used by seabirds, primarily Cory’s Shearwaters, and also by cetaceans, such as the Sperm and Fin Whales, Risso’s Dolphin, and the Common Bottle-nosed and Striped Dolphins. The 2.7 n.m. marine extension covers only part of the entire foraging range of the Cory’s Shearwater along the northwestern coast of Crete. When sufficient data on the species foraging distribution in the region become available, the boundaries of this marine IBA are expected to be significantly extended.

Ornithological Importance

The breeding population of the Cory’s Shearwater on the islets west of Gramvousa Peninsula is one of the largest in Greece. The marine area surrounding the colonies is used for foraging, resting and rafting, however Cory’s Shearwaters have been recorded feeding in the wider area between Antikythira island in the north and Kisamos Gulf in the south.

Other Species of Interest

A small population of Mediterranean Shags breeds and forages along the western coast of Gramvousa Peninsula and around the two uninhabited islets.

Uses, Threats, Management

Predation of eggs and chicks by unintentionally introduced rats is the main threat for the breeding Cory’s Shearwaters. Significant numbers of tourists and tourist boats visit Imeri Gramvousa on a daily basis and cause disturbance. Additionally, artificial lighting of the castle may cause disorientation and
even mortality of Cory’s Shearwaters returning to their breeding colonies, however, the impacts have yet to be assessed. Numerous ships, including oil tankers, travel along the western coast of Crete and cause marine pollution, resulting in traces of oil waste found along the western coast of the site. Furthermore, incidents of Cory’s Shearwater entangled in longlines during spring have been reported. Other threats such as overfishing and illegal dynamite fishing should also be evaluated given the importance of the area for Cory’s Shearwaters.
Site Description

Gavdos and Gavdopoula are the southernmost islands in Greece, situated to the south of western Crete, north of the Hellenic Trench. Gavdos is covered by maquis, phrygana, pine forests, juniper shrubs and sand dunes with juniper stands. Gavdopoula, nowadays uninhabited, is covered mainly by a few Mastic Tree stands. Particularly steep and inaccessible sections of the coastline are used by seabirds for nesting and roosting. The marine part of the IBA consists of coastal waters, including a 0.5 n.m. marine extension surrounding the two islands. Apart from seabirds, numerous cetacean species, Mediterranean Monk Seals and Loggerhead Turtles are also present in the area.
**Ornithological Importance**

Gavdos and Gavdopoula are important breeding areas for the **Mediterranean Shag** which uses the coastal marine areas surrounding the islands for foraging all year round. This population, together with the one breeding on Paximadia island located 24 n.m. to the east of Gavdos, are the southernmost breeding populations of the species in Greece, isolated by distance from those along the northern coast of Crete and the rest of the Aegean Sea.

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<tr>
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<td>150</td>
<td>P</td>
<td>good</td>
<td>B1i, B3, C2</td>
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</tbody>
</table>

**Other Species of Interest**

The wider marine area around Gavdos and the Hellenic Trench, southwest of Crete, is a regular **Cory’s Shearwater** foraging area. It is expected that these shearwaters originate from the closest known Cory’s shearwater colonies on the island group west of Gramvousa Peninsula, western Crete (GR175).

**Uses, Threats, Management**

The main threats to the quality of habitats on Gavdos and Gavdopoula are uncontrolled tourist development and the increasing number of visitors. However, the breeding and roosting sites of the Mediterranean Shag are mostly inaccessible and thus the impact of tourism is considered to be limited.

The reduction of fish stocks due to intensive fisheries and illegal fishing methods, such as the use of dynamite, as well as accidental trapping in fishing gear (nets and longlines) comprise threats for the area’s seabirds. Apart from marine pollution caused by marine traffic in the area, potential initiation of offshore hydrocarbon exploitation in the south of Crete (i.e. crude oil and natural gas), poses a possible future threat leading to oil pollution and degradation of marine habitats.

Since 2009 systematic surveys of seabirds have been carried out in the area by the Natural History Museum of Crete within the framework of the current LIFE-Nature project in cooperation with HOS.
Site Description

Dionysades is a complex of inaccessible and uninhabited islets (namely Dragonada, Gianisada, Paximada and Prasonisi) located 6 n.m. north of Siteia, in northeastern Crete. Their rugged relief, extensive steep coastal cliffs, covered by phrygana and shrub vegetation, provide numerous nesting sites for colonial seabirds and raptors. The marine area of the IBA consists of a 2.7 n.m. marine extension around Dionysades islets. The boundaries will be extended in the future to include important Cory’s Shearwater foraging areas in Siteia and Mirabello Bays. Posidonia beds occur to the west of Sidero Peninsula on the northeastern end of Crete. Common Bottle-nosed Dolphins and Mediterranean Monk Seals have been recorded in the area.

Ornithological Importance

Cory’s Shearwaters form on Dionysades one of the largest breeding populations of the species in the Aegean Sea. The colony comprises the southeastern limit of the species range. Adjacent marine waters include shearwater foraging, resting and rafting areas. Telemetry surveys using GPS dataloggers revealed that Cory’s Shearwaters breeding on Dionysades regularly feed in the marine area extending from Cape Sidero in the east, throughout the entire area of Siteia and Mirabello Bays and as far as Cape Agios Ioannis at the northwestern edge of the latter bay. Further boat-based surveys are required to delineate the extent of the Cory’s Shearwater foraging distribution in the region. Additionally, Cory’s Shearwaters from Dionysades have also been recorded feeding during the breeding season in the marine area around Kasos (GR174) and Karpathos islands in the east, as well as beyond the Aegean Sea, along the shallow coastal waters of Egypt and Lybia in northern Africa.

Other Species of Interest

Dionysades also host small breeding populations of the Yelkouan Shearwater and Audouin’s Gull each consisting of few breeding pairs. The Yellow-legged Gull population size appears to be stable at about 300 pairs.

Uses, Threats, Management

Predation of eggs and chicks by unintentionally introduced rats is the main threat for seabirds on Dionysades islets. Furthermore, illegal hunting and the subsequent disturbance caused by this activity causes problems to breeding birds since illegal hunters often visit the islets in order to hunt rabbits.
or migratory birds. Fisheries operating in the area consist mainly of local coastal fishing vessels, while tourist visits are limited. An 85 MW wind farm has been proposed on Dragonada and Gianisada posing a serious threat to the local Cory’s Shearwater population as well as other important bird species on Dionysades, such as the Eleonora’s Falcon. It is anticipated that the installation of wind farms on islets hosting shearwater colonies would lead to the destruction of breeding habitats and to increased bird mortality, directly (through collisions with wind turbines and pylons) or indirectly (due to disorientation).

Cory’s Shearwater colonies on Dionysades are the best studied colonies of the species in Greece and the Eastern Mediterranean, thanks to the efforts of Dr. D. Ristow and his colleagues who have carried out systematic and continuous surveys and monitoring since the late 1960s. During recent years monitoring and conservation activities in the area are continued by the Natural History Museum of Crete and HOS.
Site Description

This proposed IBA site includes the marine area surrounding the islands of Rineia and Delos, as well as a small part of the southwestern coast of Mykonos island, extending south of Cape Agios Georgios until Cape Glosida in Ornos Bay. It also contains the marine area surrounding Chtapodia islet located at the far east of the island. The site engulfs in total more than 15 islets and rocks. The boundary includes a 0.5 n.m. marine extension in the western part and a 2.7 n.m. extension around Chtapodia. Currently it comprises one of the smallest marine IBAs in the Cyclades, however its boundaries are expected to be extended in the future since significant numbers of shearwaters regularly forage in the area around Mykonos.

Rineia nowadays hosts only a few livestock pens and extensively cultivated cereal fields, while most of the island is covered by phrygana and abandoned terraces. Delos comprises one of the most important archaeological sites in Greece, designated as a World Cultural Site since 1990. On the highest point of Chtapodia are the remains of a WWII naval observation pillbox, while a small pier and a church exist which are visited by locals and fishermen. The coastal area surrounding Rineia and Delos is very convoluted characterised by low-lying rocky cliffs interspersed by sandy beaches and small coves with Posidonia beds. The waters are shallow, including numerous reefs and rocks and a gently sloping seafloor, with depths which do not exceed 100 m. Volcanic rocks on Chtapodia form eroding cliffs and significant scree habitats. To the north and east of Chtapodia, water depth is greater, reaching a maximum of 200 m. The northern side of Mykonos and surrounding islets is exposed to strong north-northeastern winds coming directly from the open marine area of the Central Aegean Sea and Tsiknias Strait located between Tinos and Mykonos islands. The area provides suitable habitats for cetaceans; Common Bottle-nosed and Striped Dolphins have been observed here, while Risso’s Dolphins and Sperm Whale strandings have also been reported. A small Mediterranean Monk Seal breeding population is also supported here.
Ornithological Importance

The site hosts important breeding populations of three different seabird species. A breeding population of Audouin’s Gull was first recorded here in 1998. This is one of the rare occasions where the species nests on a larger island rather than on small uninhabited islets. Colony size has remained stable over the last 15 years. The birds forage primarily along the coastal waters of Rineia, Delos and west Mykonos, but during the post-breeding season disperse in the wider area of Mykonos. Both Cory’s and Yelkouan Shearwaters breed in the area. Colonies here, together with those located on islets around the central Cyclades (Paros, Naxos, Amorgos islands), form the core shearwater breeding population of the Southern Aegean Sea (excluding Crete). These two species breed in a single moderately large mixed colony, sharing the same colony site, with nests dispersed between boulders, crevices within caves and under halophytic vegetation. The Yelkouan Shearwater breeding population, estimated at 100-250 pairs, is considered to be the second largest breeding colony in the Cyclades and the fourth most important on a national scale. Cory’s Shearwaters also hold a significant colony here with 150-250 pairs. Both species have been observed feeding in large numbers in the region around Mykonos, with the largest flocks recorded in the marine area between Mykonos,
Other Species of Interest

The nesting sites of a small resident population of Mediterranean Shags (13-15 pairs) are dispersed on the coast of most islets in the area. Their main foraging areas occur along the rocky coast of Rineia, Chtapodia and Tragonisi islets, which also hold the largest post-breeding concentrations of the species. A significant population of Yellow-legged Gulls also breeds on the islets in the area.
Uses, Threats, Management

The site receives strong influence from marine traffic during the summer months since Mykonos is one of the most popular tourist destinations in Greece, exceeding 500,000 tourist arrivals annually. The bulk of the marine traffic is concentrated in the western part of the IBA associated with numerous passenger boats from Piraeus and adjacent islands, cruise ships, local tourist tours and a significant number of privately owned vessels on their way to and from the port of Mykonos. Apart from the significant risk of marine pollution and subsequent habitat degradation, this also places great pressure on seabirds breeding on coastal habitats due to increased disturbance. According to the Special Rules applying for Mykonos Harbour, disembarkation of persons on Rineia and Delos is prohibited, as is the approach, passage or anchorage closer than 500 m from the shore. Privately owned vessels may only approach the port of Delos when the archaeological site is open to the public. Currently more than 70,000 tourists visit Delos annually using daily boat tours from Mykonos port. Thus, from April till October human presence on Delos is very intense, however visitor access is controlled. Although the same rules apply for Rineia, these are not strictly supervised. Disturbance caused by human presence during the breeding period (April till July) may cause the abandonment of the Audouin’s Gull colony or reduced breeding success since adult birds leave nests unattended. Eggs and chicks are then easily predated upon by rats and other predators such as Yellow-legged Gulls and Hooded Crows. Rats also pose a significant potential threat to shearwater nests. Relatively high mercury levels were found in feathers of Audouin’s Gull chicks from this colony, although still considered of low toxicity. Coastal fisheries in the area are mainly restricted to small local fishing boats using nets and longlines. Seabird bycatch in fishing gear has not been recorded in the area however it could pose a threat to all seabird species present.
Site Description

The proposed IBA includes the marine area surrounding Skiathos island, coastal waters along the western coast of Skopelos island from Cape Gourouni in the north to Cape Myti in the south and the entire marine area within the Strait of Skopelos, between Skopelos and Skiathos. The area contains a 0.5 n.m. marine extension along the entire included coastline of Skiathos, Skopelos and nearby islets.
Ornithological Importance

The site is important for the breeding and non-breeding populations of the Mediterranean Shag. The number of individuals increases during the post-breeding season, indicating immigration from other sites, probably from the eastern part of the Northern Sporades around Alonnisos island. Mediterranean Shags forage in coastal waters along the shore of Skiathos and west Skopelos, as well as in the Strait of Skopelos.

During recent years an Audouin's Gull colony has been established on one of the uninhabited islets of Skiathos. Associated foraging areas, located in the eastern part of the site, are also used during the post-breeding period.

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Other Species of Interest

Cory's and Yelkouan Shearwaters forage in the marine area of Skiathos, however in much smaller numbers than those found in the neighbouring Alonnisos region. Up to 5,000 Yelkouan Shearwater individuals have been recorded in Skiathos Strait, between the Peninsula of Pelion and Skiathos. Further surveys are required to verify the regular use of the strait during Yelkouan Shearwater passage. Additionally, Yellow-legged Gulls breed on uninhabited islets around Skiathos and Skopelos.

Uses, Threats, Management

Skiathos receives high levels of tourism, therefore disturbance by tourist and recreational activities is the main threat at breeding or roosting sites of the Mediterranean Shag and Audouin's Gull. Due to the remoteness of these sites the impacts of coastal development, mainly associated with tourism, are limited.

Commercial and passenger shipping traffic is intense, particularly along the southern part of the area and in the Strait of Skopelos, introducing a high risk of oil spills and marine pollution.
Site Description

The proposed IBA contains marine areas in the western and southern Saronikos Gulf, surrounding 19 islets and rocks, namely the Diaporoi islet group (made up of Agios Ioannis, Agios Thomas, Tragonisi, Ledou and Molai islets), the islets north-west of Aegina island (namely Ipsili, Stahtorogi, Plateia, Panagitsa and Eleousa islets), as well as islets Petrokaravo and Platia located north of Poros island. The area includes a 1 n.m. marine extension around all afore-mentioned islets, apart from Petrokaravo and Platia where the marine extension is 0.5 n.m. from the coast. The islets exhibit mostly rocky low-lying shores, few coastal cliffs and are covered by maquis vegetation.

This site includes the main foraging and maintenance areas for the Mediterranean Shag population of the western Saronikos Gulf. It also contains important foraging grounds of Cory’s and Yelkouan Shearwaters. A small part of their foraging areas in Saronikos Gulf is already included in the proposed IBA, however the boundaries are expected to be extended in the future when more information becomes available. Additionally, cetaceans such as the Fin and Sperm Whales, the Common Bottlenosed and Short-beaked Common Dolphins have been recorded in the area, as have the Mediterranean Monk Seal and Loggerhead Turtle.

Ornithological Importance

A medium-sized population of Mediterranean Shags nests on uninhabited islets in the western part of Saronikos Gulf. During the post-breeding season birds disperse within the Saronikos Gulf with important congregations on the islets north of Poros.

Other Species of Interest

Flocks up to few hundred Yelkouan and Cory’s Shearwater individuals are regularly observed foraging in the wider area of the central Saronikos Gulf, particularly during the breeding season. The islets also host large breeding colonies of the Yellow-legged Gull, exceeding 4,000 pairs. A small number of Common Terns also breeds in the area.

Uses, Threats, Management

The main threat relating to the Mediterranean Shag colonies and nearby foraging areas is disturbance caused by numerous recreational vessels and fishing boats present. Large populations of Yellow-legged Gulls and introduced rats pose an additional threat to Mediterranean Shag eggs and chicks. One fish farm occurs within the site, while numerous more in the surrounding area e.g. along the coast.
of Salamina island and the coastal waters of the Peloponnese. Their impact e.g. through pollution, degradation of islet nesting habitat or disturbance of the breeding seabird populations, have not been studied and remain to be assessed. Apart from the above, coastal development on uninhabited islets is minimal. However coastal areas of the surrounding inhabited islands (Aegina, Salamina, Agistri and Poros), as well as the mainland coast of Saronikos Gulf are highly urbanised, especially relating to tourist facilities.

Saronikos Gulf comprises an important fishing ground where fish stocks have been affected by overfishing. This poses a serious threat to all seabird species foraging in the area, as well as to other marine predators. Yelkouan and Cory's Shearwaters, which are regularly present in large numbers in Saronikos Gulf, are primarily at risk of being accidentally trapped in fishing gear. The marine environment of Saronikos Gulf receives one of the heaviest pollution loads in Greece; increased levels of organic and inorganic contaminants, heavy metals and solid wastes originate from domestic and industrial sources in the wider area of Attica, and from naval activities (i.e. mainly in Piraeus and Elefsina ports), as well as from intense marine traffic. Since 1994, pollution levels have significantly decreased due to the operation of the waste water treatment plant on Psittalia island. Excessive marine traffic, especially during the tourist season from April till October, generates the additional, long-term threat of marine accidents and thus of oil spills.
Site Description
This proposed IBA includes marine areas between Attica and Evvoia, surrounding more than 30 uninhabited islets in South Evvoikos Gulf. The area extends from Kamari Bay on the northern coast of Evvoia up to Petalioi Gulf in the southeast, and from Varnavas Beach in the northern coast of Attika to Marathonas Bay at the latitude of the city of Rafina. The boundary adjoins to the limits of the marine component of the existing IBA of Schinias Marsh (GR125). The sea is shallow with depths not exceeding 80 m. High prey availability attracts seabirds, as well as marine mammals such as the Common Bottle-nosed and Short-beaked Common Dolphins and the Mediterranean Monk Seal, all of which have been recorded in the area. Uninhabited islets are covered by low maquis and phrygana vegetation and provide suitable nesting sites for seabirds.

Ornithological Importance
There is a resident population of the Mediterranean Shag in the area. The birds breed on uninhabited islets within the Petalioi Gulf and South Evvoikos Gulf and use adjacent marine areas for foraging all year round.

The proposed IBA includes only part of the Yelkouan Shearwater foraging range in South Evvoikos Gulf, which extends from the Strait of Kafireas on the eastern coast of Evvoia and reaches Porto Rafti on the southeast coast of Attica. Data from ESAS surveys suggest that at least 100-250 Yelkouan Shearwater individuals regularly use the marine area of the proposed IBA, while the total number of birds regularly foraging in the South Evvoikos Gulf ranges from several hundred to a few thousand individuals during the breeding and post-breeding season. Therefore, in the future when sufficient data from boat-based surveys are collected, the boundaries of the proposed IBA are expected to become extended east and southwards. The origin of those Yelkouan Shearwaters feeding in the area remains unknown as no colonies have been found in the South Evvoikos Gulf.

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Other Species of Interest
Cory’s Shearwaters also feed in the area during the breeding season. Their foraging range to a large extent overlaps with that of the Yelkouan Shearwater, particularly along the southern coast of Evvoia, however their numbers are significantly lower.

Large populations of the Yellow-legged Gull (over 3,000 pairs) breed on the islets of South Evvoikos Gulf. These gulls regularly visit feeding places (rubbish landfills, agricultural areas) on Attica and Evvoia and feed on fisheries discards. The resulting abundance of food sources has led to the dramatic increase of their population in the area.
Uses, Threats, Management

The coastal areas of the site have become highly urbanised over the last two decades, particularly as a result of tourist development, mainly related to the construction of holiday homes. Mediterranean Shag colonies and roosting sites therefore experience disturbance by tourist, as well as fishing (professional and amateur) activities. Predation of eggs and chicks by Yellow-legged Gulls and introduced rats poses a threat to Mediterranean Shags breeding in the area. Marine pollution results primarily from tourist, domestic and agricultural activities and is thus highest during the summer months. Additional pollution is caused by industrial units operating along the coast of South Evvoikos Gulf. The main contributor in terms of pollution load is the river of Asopos, 13 n.m. to the northwest of the site, which receives wastes from smelting plants, other industry and dumping sites. However, due to the areas cyclonic water circulation patterns, pollutant levels are relatively low. Numerous fish farm units are situated in Petalioli Gulf and along the southern coast of Evvoia. Intense marine traffic through the Kafireas Strait and along the eastern part of South Evvoikos Gulf generates a permanent threat of marine accidents with potential oil and chemical pollution. Accidental trapping in fishing gear of professional and amateur fisheries poses a threat primarily for Yelkouan and Cory’s Shearwaters, as shearwater bycatch incidents have been recorded in the area. Finally, the installation and operation of a 277 MW offshore wind farm which is proposed to be built just outside the Marathon Bay would negatively affect Yelkouan Shearwaters and Mediterranean Shags feeding in the area.
The proposed marine IBA includes seaward extensions for some of the largest and most important Mediterranean Shag colonies in Greece, located on uninhabited islets and inaccessible coastal cliffs. The local breeding population represents more than 10% of the national breeding population of the species and its main colony sites have already been included in terrestrial IBAs (GR012 and GR016). Additionally, it is estimated that more than 17% of the national wintering population spends the post-breeding period in the area. Based on the results of boat-based surveys, telemetry and ring recoveries it has been confirmed that Mediterranean Shags disperse throughout the entire area of the proposed marine IBA in search of food. Since the area is characterised by shallow waters, the species foraging areas are not exclusively restricted to the coastal zone. Abundant schools of small and medium-sized pelagic fish, such as anchovies and sardines, attract pelagic seabirds, primarily Yelkouan.
Shearwaters. Flocks consisting of several tens to several hundreds of individuals regularly feed in the entire area of the proposed IBA. However, large foraging concentrations of Yelkouan Shearwaters have also been recorded in pelagic areas beyond the eastern and southern boundaries, indicating that some significant foraging areas of the species around Thasos remain to be included. Therefore, further surveys are considered essential in order to delineate them. Since no breeding colony of the species has been located in the area, it is assumed that these shearwaters come from colonies found in the northern and potentially central Aegean Sea. The highest numbers of Yelkouan Shearwater have been recorded in the area during the winter months when birds return from the Black Sea to their breeding sites in the Aegean Sea and the rest of the Mediterranean Sea, however significant foraging congregations are recorded during the breeding season as well.

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Other Species of Interest

The area is regularly used by foraging Cory’s Shearwaters during the breeding season. The species does not breed in the area, so therefore it is believed that these birds originate from colonies in the North and Central Aegean Sea. Due to the widespread availability and abundance of anthropogenic food sources, such as fisheries discards, agriculture and landfills, the area hosts a large breeding population of Yellow-legged Gulls, the minimum size of which is estimated at 5,000-10,000 pairs. The main Yellow-legged Gull colonies are located on the same islets where the most significant Mediterranean Shag colonies occur.
Uses, Threats, Management

The marine environment in the area is highly affected by human activities along the coast and at sea. Tourist development and recreational activities have negative effects on coastal and marine areas in the vicinity of all major colony sites. The main threat for the Mediterranean Shag is disturbance at colony sites and in surrounding marine areas mainly relating to tourists and fishermen, particularly amateur fishermen. Disturbance in the past years has been intense leading to negative impacts on the breeding success of the species. During recent years amateur fishermen regularly stay overnight on those islets hosting the largest Mediterranean Shag colonies. The species’ breeding performance is also affected by introduced rats and overabundant Yellow-legged Gulls which prey on eggs and chicks.

The Gulf of Kavala and surrounding areas of the North Aegean Sea comprises one of the most important fishing grounds in Greece. Threats for Yelkouan Shearwaters and Mediterranean Shags include reduced fish-stocks and disturbance during the breeding season arising from intensive trawling operations, as well as illegal fishing practices which are frequently reported. Accidental trapping in nets and longlines also presents a significant threat for both species. In 2012, more than 70 Yelkouan Shearwaters were found entangled in one single net, although such mass incidents are rare. There are numerous aquaculture units in the area, mainly mussel and fish farms, primarily located within the Strait of Thasos. The intensity of commercial and passenger shipping traffic, fishing and recreational activities exhibits large spatial and temporal variations, however in general is considered high.

A proposed 156 MW offshore wind farm in the marine region north of Thasos comprises a potential threat to Mediterranean Shags and Yelkouan Shearwaters, which use the area for feeding all year round. The coastal area around the Gulf of Kavala is highly urbanised and industrial. The gulf is affected by pollution from intense industrial activities i.e. phosphoric fertilizer plant, oil refinery, wastewater treatment plants, the operation of the commercial port and aquaculture units, as well as agricultural runoffs. Apart from heavy metals, these sources of pollution lead to high nutrient loads which cause frequent eutrophication events. The subsequent algal blooms may have severe impacts on seabirds and the rest of marine wildlife. An extensive algal bloom event in winter and spring 2009-10 caused almost complete failure of the Mediterranean Shag breeding performance during 2010 and 2011 in the entire area. Additionally, the area is the main exploitation site for crude oil and natural gas in Greece, thus posing a permanent threat of oil pollution to the wider area of the Gulf of Kavala.

The national importance of the area for the Mediterranean Shag led to the systematic monitoring of its colonies carried out since 2007 by HOS in collaboration with the University of Patras. Additionally, during the period 2010-12, rat eradication and Yellow-legged Gull population control actions have been implemented to improve the breeding success of the Mediterranean Shag.
Site Description

The proposed marine IBA extends along the southwestern, western and northwestern coast of Lesvos island from Cape Kopanos in the south, up to Cape Fournia in the north. The boundary contains a 3 n.m. marine extension which engulfs 10 uninhabited islets. The largest of these, Megalonisi (or Nisiopi), is an elongated islet covered by phrygana and scattered remains of the petrified forest of Lesvos. Its location forms a barrier which protects the harbour of Sigri. This protruding western headland forces migratory seabirds to concentrate in the vicinity of Lesvos coast. Mediterranean Monk Seals have also been recorded in the area.

Ornithological Importance

The site has been recognised as the most important shearwater bottleneck in Greece with thousands of Yelkouan and Cory’s Shearwaters passing through from the North Aegean Sea and the Black Sea on their way to the South Aegean Sea and the Mediterranean Sea and vice versa. The number of seabirds using this area has been established by coastal counts carried out from the region of Sigri, while the extent of the migratory bottleneck by boat-based surveys. The area is used extensively by shearwaters both while on migration as well as during the breeding season.

The Black Sea and the Aegean Sea have been identified as two of the main areas where Yelkouan Shearwaters spend the post-breeding period. A large proportion of the global population of this species is considered to migrate along the western coast of Lesvos from their breeding colonies in the Mediterranean Sea towards their wintering areas in the Black Sea. Additionally, the bottleneck is regularly used on a daily basis by thousands of Cory’s and Yelkouan Shearwaters during the breeding season when individuals move between their colonies located to the south of Lesvos and their foraging areas in the North Aegean Sea and potentially into the Marmara Sea, beyond the Dardanelles Strait. The passage of seabirds through this area from South to North is particularly concentrated i.e. from the direction of Chios and Psara islands towards Limnos island and the Dardanelles Strait, because Lesvos represents a natural barrier for their flight northwards. On the other hand, for seabirds flying through from the North, Lesvos is less of an obstacle, therefore shearwater passage from North to South is less concentrated along the coast of Lesvos. The origin of those shearwaters using the area during the breeding season still remains unknown, however due to their abundance it is expected that they come from various colonies in the eastern Aegean Sea (Psara, Fournoi, Dodecanese) and/or the Cyclades. Additional telemetry surveys at these colonies are required to determine the extent of their foraging areas and the flight routes followed.

Other Species of Interest

There is a small resident population of the Mediterranean Shag in the area with breeding sites located on uninhabited islets off the western coast of Lesvos. A colony of Audouin’s Gulls has also been recorded in the past, however during recent years the species has not been observed breeding in the

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Lesvos lies close to one of the major Mediterranean tanker and trading routes between the Black Sea and Aegean Sea. Thus, intense marine traffic to and from the Dardanelles Strait and the Black Sea poses the greatest threat to seabirds in the area due to the high risk of marine accidents and resulting oil spills. Since large numbers of shearwaters migrate through this area, accidental trapping in fishing gear is a probable threat.
Site Description

This important Yelkouan Shearwater migratory bottleneck includes extensive marine areas located between the eastern part of Attica Peninsula and Makronisos island covering the entire channel. The proposed marine IBA boundary extends from Porto Rafti Bay on the eastern coast of Attica, down to Cape Sounio and from there westwards till Cape Katafygi, including Patroklos islet in Saronikos Gulf. Thereafter, the boundaries reach to the east until Cape Agalistros on the southern tip of Makronisos, following the western coast of the island until the northern point at Cape Trypiti, and from there extends 8 n.m. northwards up to the latitude of Porto Rafti. The area contains a 1 n.m. marine extension on the southern limits and together with Patroklos islet engulfs in total nine uninhabited islets. In its current extent, the site includes areas with large Yelkouan Shearwater congregations, however particularly in its northern boundaries, the site may be extended in the future when more data from boat-based surveys are available.

Ornithological Importance

The proposed IBA is an important migratory bottleneck and staging area for Yelkouan Shearwaters during spring migration movements from the Black Sea and Northern Aegean to their colony sites in the Mediterranean Sea. Yelkouan Shearwaters have also been recorded feeding in the area during the breeding season, but in significantly smaller numbers than those recorded during migration.

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Other Species of Interest

The strait between Attica and Makronisos is used by Cory’s Shearwaters for foraging during the breeding season. Mediterranean Shags are present in the area in small numbers.

Uses, Threats, Management

The site is located between the two major shipping corridors of the western Aegean Sea, in the Saronikos and South Evvoikos Gulfs. The largest proportion of passenger ships leaving Piraeus port on their way to the Cyclades, Dodecanese and Crete pass at a close distance from the southern end of the site. In addition, the smaller port of Rafina, located to the north of the site serves frequent passenger lines to Evoia and the Cyclades on a daily basis. Lavrio, once an important mining centre and industrial and commercial port, is located within the site, although nowadays it mainly hosts local fishing boats and recreational vessels. Thus, marine pollution, either through accidents leading to oil and chemical spills or through the discharge of ballast water, are considered the most important and continuous threat to seabirds in this area. The marine area is also affected by pollution originating from domestic
and touristic waste, as well as industrial and historical mining activities. The extensive mounds of metallurgical refuse which still remain on the coast as well as the Local Power Plant constitute permanent sources of pollution which ends up in the marine environment. Since 2010, the Local Power Plant has been modified to operate using natural gas which has mitigated the risk of land based oil pollution.

The area exhibits intense tourist and urban development, mainly through summer housing of the inhabitants of Athens, while amateur fishing and recreational activities at sea, such as marine sports, bathing and sailing are widespread.
Site Description

This site is located to the east and southeast of Naxos island, extending eastwards up to Amorgos island. It includes a large complex marine area entirely engulfing an island group commonly known as ‘Mikres Kyklades’ (i.e. Small Cyclades), made up of the small inhabited islands of Irakleia, Schoinousa, Kato Koufonisi, Koufonisi and Donousa, the uninhabited islands of Keros and Antikeria and more than 40 scattered smaller uninhabited islets, including the islet group of Makares in the east of Naxos. The site also incorporates the marine area around western Amorgos from Cape Alatos in the
Ornithological Importance

The site has been designated for the populations of four seabird species, all of which breed here in significant numbers. The shearwaters occur in two mixed colonies located on their typical breeding habitat of moderately sloping rocky cliffs with fallen boulders and soft substrate. The 1,050-1,410 pairs of Yelkouan Shearwaters comprise the second largest breeding population nationally and the most important in the Cyclades. The Cory's Shearwater population is considerably smaller, but still locally significant (165-275 pairs). Tracking data from breeding individuals suggest that the species forages as far as los and Folegandros islands during the breeding period, more than 40 n.m. from the colony.

The marine area of Amorgos comprises also western coast till Cape Kapsala in the east. The boundary contains a 2.7 n.m. marine extension around Antikeria and Makares, while the remaining area includes a 0.5 n.m. marine extension. The boundaries of the marine IBA are expected to be significantly expanded in the future, when sufficient data are available for the delineation of important foraging areas for shearwaters which have been recorded in significant numbers throughout the entire marine area between Naxos and Amorgos. Apart from the low-lying coastline of Koufonisia, with its renowned sandy beaches, the rest of the ‘Mikres Kyklades’ islands are rocky, with medium height cliffs, covered by sparse shrubland and phrygana. The southern coast of Amorgos is mainly characterised by vertical cliffs, reaching up to 400 m in height. The waters surrounding ‘Mikres Kyklades’ are generally shallow, deepening to more than 200 m in the south of Antikeria islets, in eastern Donousa and the southern coast of Amorgos. The entire marine area is influenced by very strong winds, waves and currents. Marine habitats are found here in good conservation status, such as extensive Posidonia beds especially along the seafloor of Koufonisia, Keros and Schinousa. The site also comprises a breeding area for the Mediterranean Monk Seal. Other marine mammals reported in the site are the Harbour Porpoise, the Striped Dolphin and the Short-beaked Common Dolphin.
important foraging grounds for the Audouin’s Gull breeding population (10-50 pairs). Their local population has been monitored intermittently for more than 15 years and three different uninhabited islets have been used for nesting. Adult birds from this population probably breed also on islets surrounding Keros or other islets close by, thus the colony has not been present in the area every year.

Tracking data have shown that the coastal area around Antikeria, as well as the southern coast of Amorgos is used for foraging by the species. Finally, a Mediterranean Shag population (75-81 pairs) breeds on the coastline of Mikres Kyklades, Donousa and Makares. A significant population also overwinters in the region (200-260 individuals).

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Other Species of Interest

The European Storm-petrel has been observed foraging in the wider area around the site, however, breeding has not been confirmed within it. The Yellow-legged Gull breeds on most islets (> 300 pairs) scattered all around the site, with the largest colonies located on the islets of ‘Mikres Kyklades’ and Amorgos.
The main threat identified in this marine IBA is disturbance of breeding seabirds caused by human presence on the islets and inaccessible parts of the coastline of the area. Although shepherds and sheepdogs rarely land on breeding islets to remove goats, such an incident has caused the abandonment of the colony at least on one occasion in the past. Fishermen often find refuge in small bays in Antikeria, Makares, Donousa and Irakleia. The use of lights at night has been shown to cause light pollution and thus disorientation and disturbance of breeding shearwaters trying to locate their pair. There is evidence suggesting that Peregrine Falcons and Bonelli’s Eagles have been responsible for the predation of Audouin’s Gull chicks. Predation of chicks and eggs by Yellow-legged Gulls and introduced rats has also been recorded. Rat population eradication actions are expected to ameliorate conditions for the Audouin’s Gull. The area comprises an important sailing destination, although marine traffic and tourist infrastructures are still limited. According to local fishermen, overfishing and accidental trapping in fishing gear (nets and longlines) constitute threats for seabirds, mainly Yelkouan and Cory’s Shearwaters. Illegal fishing methods are still in use, such as dynamite fishing, which have detrimental impacts on the overall marine environment and thus on the availability of prey for seabirds.
9. References

9.1 General References


BirdLife International (2012c) IUCN Red List for birds. Downloaded from http://www.birdlife.org on 30/12/2012.


RAE (2012) Geographic viewer of applications for renewable energy projects. Regulatory Authority for Energy. Available at: www.rae.gr Date: 7/12/2012. [In Greek].


Skotti, E., Lambropoulou, D. and E. Spanidi (2012) Analysis of samples collected at the colonies of the target species for Heavy Metals, PCBs and Organochlorine pesticide compounds. LIFE-Nature “Concrete conservation actions for the Mediterranean Shag and Audouin’s Gull in Greece, including the inventory of relevant marine IBA” (LIFE07 NAT/GR/000285). Project report.


### 9.2 Site account references

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Adamantopoulou, S. and E. Androukaki (1987) Study on the birds of the National Park of the Northern Sporades. (thesis) Section of Ecology and Taxonomy, Department of Biology, National and Kapodistrian University of Athens. [In Greek]


Catsadorakis G. Unpublished data.


Hellenic Ornithological Society (2001) Seabird recordings in Cyclades and Dodecanese during trip to Amorgos with Inflatable Boats Association of Greece. (Unpublished report) [In Greek]


Kardakari, N. Unpublished data.


Karris G. (2012) Unpublished data


Karris, G., Martinis, A., Minotou, Ch. and P. Kapodistrias (2011) The environmental use, the socio economic development and the integrated management of remote islets under the concept of sustainable development. The case of Strofades. International conference for organic agriculture and agro-eco tourism in the Mediterranean, Zakynthos, Greece, 16-18 September.


OIKOM Environmental Studies Ltd. (2009) Specific Environmental Assessment on Gavdos - Gavdopoula islands [In Greek]


86 Regulatory Authority for Energy (2012). Geographic viewer of applications for renewable energy projects. www.rae.gr Date: 7/12/2012. [In Greek]


89 Ristow D. Unpublished data.


91 Ristow, D. Unpublished data.

92 Ristow, D. Unpublished data.


Appendix 10.1: IBA criteria

IBAs are selected through the application of specific, quantitative, ornithological criteria based on up-to-date knowledge of the sizes and trends of bird populations. Thus, the criteria ensure that sites selected as IBAs have true significance for the conservation of bird populations on an international level.

The selection of IBAs is determined by 20 criteria which allow for the identification of a site as an IBA based on its international significance for:

- Threatened bird species
- Congregatory bird species
- Assemblages of restricted-range bird species
- Assemblages of biome-restricted bird species

Criteria have been developed such that, by applying different numerical thresholds, the international importance of a site for a species may be categorised at three distinct geographical levels:

- Site of global importance (A criteria)
- Site of European importance (B criteria)
- Site of importance within the European Union (C criteria)

In order to determine if a site qualifies as an IBA, all available information regarding bird species and populations which use the site during different seasons of the year must be initially gathered. When a specific bird species is present in a site in sufficient numbers meeting the relevant numerical thresholds, then this is considered a ‘trigger species’ (or ‘qualifying species’ in the past) and the IBA criteria are met for this site. Each criterion is thus related to a list of relevant bird species, corresponding to an equivalent numerical threshold that has to be matched or exceeded in order for that site to qualify. Population thresholds arise from bird population data derived by internationally recognised sources, such as BirdLife International and Wetlands International.
Appendix 10.1: IBA criteria (continued)

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A1. Globally threatened species</td>
<td>The site regularly holds significant numbers of a globally threatened species, or other species of global conservation concern.</td>
<td>A1</td>
</tr>
<tr>
<td>A2. Restricted-range species</td>
<td>The site is known or thought to hold a significant component of the restricted-range species whose breeding distributions define an Endemic Bird Area (EBA) or Secondary Area (SA).</td>
<td>A2</td>
</tr>
<tr>
<td>A3. Biome-restricted species</td>
<td>The site is known or thought to hold a significant assemblage of the species whose breeding distributions are largely or wholly confined to one biome.</td>
<td>A3</td>
</tr>
<tr>
<td>A4. Globally important congregations</td>
<td>(i) The site is known or thought to hold simultaneously, on a regular basis, ≥ 1% of the global population of a congregatory species.</td>
<td>A4i</td>
</tr>
<tr>
<td></td>
<td>(ii) The site is known or thought to be a focus of congregation at which &gt; 1% of a global population of a species occurs on a regular basis within a short period of time, as a result of the rapid turnover of individuals.</td>
<td>A4ii</td>
</tr>
<tr>
<td></td>
<td>(iii) The site is known or thought to hold, on a regular basis, ≥ 20,000 waterbirds or seabirds or ≥ 10,000 pairs of seabird of one or more species.</td>
<td>A4iii</td>
</tr>
<tr>
<td></td>
<td>(iv) The site is known or thought to be a ‘bottleneck’ site where at least 20,000 storks (Ciconiidae), raptors (Accipitriformes and Falconiformes) or cranes (Gruidae), or ‘n’ seabirds, pass regularly on migration during their annual cycle.</td>
<td>A4iv</td>
</tr>
<tr>
<td>B1. Regionally important congregations</td>
<td>(i) The site is known or thought to hold simultaneously, on a regular basis, ≥ 1% of a biogeographic (or other distinct) population of a congregatory species.</td>
<td>B1i</td>
</tr>
<tr>
<td></td>
<td>(ii) The site is known or thought to be a focus of congregation at which &gt; 1% of a biogeographic (or other distinct) population of a species occurs on a regular basis within a short period of time, as a result of the rapid turnover of individuals.</td>
<td>B1ii</td>
</tr>
<tr>
<td></td>
<td>(iii) The site is known or thought to hold, on a regular basis, ≥ 1% of a biogeographic (or other distinct) population of a congregatory species other than a waterbird or seabird.</td>
<td>B1iii</td>
</tr>
<tr>
<td></td>
<td>(iv) The site is a ‘bottleneck’ site where over 5,000 storks (Ciconiidae), or over 3,000 raptors (Accipitriformes and Falconiformes) or cranes (Gruidae), or over ‘n’ 1’ seabirds pass regularly on migration during their annual cycle.</td>
<td>B1iv</td>
</tr>
<tr>
<td>B2. Species with an unfavourable conservation status in Europe</td>
<td>The site is one of the ‘n’ most important in the country for a species with an unfavourable conservation status in Europe (SPEC 2, 3) and for which the site-protection approach is thought to be appropriate.</td>
<td>B2</td>
</tr>
<tr>
<td>B3. Species with a favourable conservation status in Europe</td>
<td>The site is one of the ‘n’ most important in the country for a species with a favourable conservation status in Europe but concentrated in Europe (SPEC 4) and for which the site-protection approach is thought to be appropriate.</td>
<td>B3</td>
</tr>
<tr>
<td>C1. Species of global conservation concern</td>
<td>The site regularly holds significant numbers of a globally threatened species, or other species of global conservation concern.</td>
<td>C1</td>
</tr>
<tr>
<td>C2. Concentrations of species threatened at the European Union level</td>
<td>The site is known to regularly hold (either simultaneously, or within a short period of time, as a result of the rapid turnover of individuals) at least 1% of the biogeographic or EU population of a species considered to be threatened in the EU.</td>
<td>C2</td>
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<tr>
<td>C3. Migratory non-threatened species</td>
<td>The site is known to regularly hold (either simultaneously, or within a short period of time, as a result of the rapid turnover of individuals) at least 1% of a biogeographic population of a migratory species that is not considered to be threatened in the EU.</td>
<td>C3</td>
</tr>
<tr>
<td>C4. Large congregations</td>
<td>The site is known to regularly hold at least 20,000 migratory waterbirds or seabirds or at least 10,000 pairs of migratory seabird, of one or more species.</td>
<td>C4</td>
</tr>
<tr>
<td>C5. Large congregations- ‘bottleneck’ sites</td>
<td>The site is a ‘bottleneck’ site where over 5,000 storks (Ciconiidae), and/or over 3,000 raptors (Accipitriformes and Falconiformes) and/or cranes (Gruidae), and/or ‘n’ 1’ seabirds pass regularly on migration during their annual cycle.</td>
<td>C5</td>
</tr>
<tr>
<td>C6. Species threatened in the European Union</td>
<td>The site is one of the five most important in the European region in question for a species or subspecies considered threatened in the European Union.</td>
<td>C6</td>
</tr>
<tr>
<td>C7. Other ornithological criteria</td>
<td>A site which has been designated as a Special Protection Area (SPA), or has been selected as a candidate SPA, based on ornithological criteria (similar to, but not equal to, C1–C6) in recognised use for identifying SPAs.</td>
<td>C7</td>
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Appendix 10.2: Numerical thresholds for marine IBA identification.

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<td>–</td>
<td>60 i</td>
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<td>–</td>
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<tr>
<td>A4i</td>
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<td>2350 i</td>
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<td>A4ii</td>
<td>8700 i</td>
<td>960 i</td>
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<td>15000 i</td>
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<td>300 i</td>
<td>580 i</td>
<td>–</td>
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<tr>
<td>B1ii</td>
<td>1090 i</td>
<td>960 i</td>
<td>–</td>
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<td>300 i</td>
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<td>B1iv</td>
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<td>960 i</td>
<td>300 i</td>
<td>580 i</td>
<td>300 i</td>
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* applicable to biogeographic populations   - not applicable   i=individuals   p=pairs   \* testing underway to determine appropriate threshold
### Appendix 10.3: Seabird and waterbird species in Greece and their conservation status

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<td>wv</td>
<td>3W</td>
<td>EN</td>
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<tr>
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<td>Common Eider</td>
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<td>—</td>
<td>S</td>
<td>II/2; III/2</td>
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<td>Melanitta nigra</td>
<td>Common Scoter</td>
<td>wv</td>
<td>—</td>
<td>(S)</td>
<td>II/2; III/2</td>
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<td>Velvet Scoter</td>
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<td>EN</td>
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<td>VU</td>
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<td>(S)</td>
<td>II/2</td>
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<tr>
<td>Bucephala clangula</td>
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<td>—</td>
<td>(S)</td>
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<td>Goosander</td>
<td>WV</td>
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<td>(S)</td>
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<td>CR</td>
<td>—</td>
<td>(S)</td>
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<td>3</td>
<td>(H)</td>
<td>I</td>
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<td></td>
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<td>3</td>
<td>(VU)</td>
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<td>Clonectris diomedea</td>
<td>Cory’s Shearwater</td>
<td>SV</td>
<td>2</td>
<td>(VU)</td>
<td>I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Puffinus yelkouan</td>
<td>Yelkouan Shearwater</td>
<td>R</td>
<td>VU</td>
<td>NT</td>
<td>—</td>
<td>I</td>
<td></td>
</tr>
<tr>
<td>Hydrobates pelagicus</td>
<td>European Storm-petrel</td>
<td>sv</td>
<td>DD</td>
<td>—</td>
<td>(S)</td>
<td>I</td>
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<td>—</td>
<td>S</td>
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<td>3</td>
<td>D</td>
<td>I</td>
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<td>NT</td>
<td>—</td>
<td>(S)</td>
<td>I***</td>
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<td>Red-necked Phalarope</td>
<td>pm</td>
<td>—</td>
<td>(S)</td>
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<td>Larus canus</td>
<td>Mew Gull</td>
<td>WV</td>
<td>2</td>
<td>(H)</td>
<td>II/2</td>
<td></td>
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<td>Larus audouinii</td>
<td>Audouin’s Gull</td>
<td>r</td>
<td>NT</td>
<td>VU</td>
<td>1</td>
<td>L</td>
<td>I</td>
</tr>
<tr>
<td>Larus argentatus</td>
<td>Great Black-backed Gull</td>
<td>wv, pm</td>
<td>—</td>
<td>S</td>
<td>II/2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Larus michahellis</td>
<td>Yellow-legged Gull</td>
<td>R</td>
<td>—</td>
<td>S</td>
<td>II/2</td>
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<tr>
<td>Larus fuscus</td>
<td>Lesser Black-backed Gull</td>
<td>pm, wv</td>
<td>—</td>
<td>S</td>
<td>II/2</td>
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<td>WV, r</td>
<td>—</td>
<td>(S)</td>
<td>II/2</td>
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<tr>
<td>Larus genei</td>
<td>Slender-billed Gull</td>
<td>WV, PM, r</td>
<td>VU</td>
<td>3</td>
<td>L</td>
<td>I</td>
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<tr>
<td>Larus melanocephalus</td>
<td>Mediterranean Gull</td>
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<tr>
<td>Larus minutus</td>
<td>Little Gull</td>
<td>PM, wv</td>
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<tr>
<td>Rissa tridactyla</td>
<td>Black-legged Kittiwake</td>
<td>wv</td>
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<td>(S)</td>
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<tr>
<td>Sterna hirundo</td>
<td>Common Tern</td>
<td>SV, PM</td>
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<td>Sterna albifrons</td>
<td>Little Tern</td>
<td>SV, PM</td>
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<tr>
<td>Stercorarius parasiticus</td>
<td>Parasitic Jaeger</td>
<td>pm</td>
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<td>Common Name</td>
<td>Season Status</td>
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<tr>
<td><em>Parasitic Jaeger</em></td>
<td><em>S.</em></td>
<td>Categories and data after Handrinos and Akritios (1997).</td>
<td>R: Resident</td>
<td>SV: Summer visitor (breeding)</td>
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<tr>
<td><em>Black Tern</em></td>
<td><em>S.</em></td>
<td>Categories and data after Handrinos and Akritios (1997).</td>
<td>PM: Partial migrant</td>
<td>PM: Partial migrant</td>
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<td><em>Great Black-backed Gull</em></td>
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<td><em>Larus fuscus</em></td>
<td><em>Yellow-legged Gull</em></td>
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<td><em>Larus argentatus</em></td>
<td><em>Herring Gull</em></td>
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<td><em>Red-necked Phalarope</em></td>
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<td>NV: Non-breeding visitor</td>
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<td><em>Phalacrocorax carbo</em></td>
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<td><em>Podiceps cristatus</em></td>
<td><em>Great Crested Grebe</em></td>
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<tr>
<td><em>Yelkouan Shearwater</em></td>
<td><em>European Storm-petrel</em></td>
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<td>NV: Non-breeding visitor</td>
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<tr>
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<td>NV: Non-breeding visitor</td>
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<td><em>Melanitta fusca</em></td>
<td><em>Common Scoter</em></td>
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<td>NV: Non-breeding visitor</td>
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<tr>
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<td><em>Greater Scaup</em></td>
<td>Categories and data after Handrinos and Akritios (1997).</td>
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<td>NV: Non-breeding visitor</td>
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<td><em>Gavia stellata</em></td>
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<td><em>Mergus serrator</em></td>
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<td><em>Melanitta nigra</em></td>
<td><em>Greater Scaup</em></td>
<td>Categories and data after Handrinos and Akritios (1997).</td>
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<td><em>Gavia stellata</em></td>
<td><em>Goosander</em></td>
<td>Categories and data after Handrinos and Akritios (1997).</td>
<td>NV: Non-breeding visitor</td>
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**Note:** The Mediterranean Shag (Phalacrocorax aristotelis desmonastri) occurs in the Mediterranean Sea and is the subspecies of the European Shag (Phalacrocorax aristotelis). Data presented for L. michahellis is that for L. cachinnans after BirdLife International (2004a), before the species was split into L. cachinnans and L. michahellis.
### Appendix 10.4: Phenology

<table>
<thead>
<tr>
<th>Species</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
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<tr>
<td><strong>Calonectris diomedea</strong></td>
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<td><strong>Puffinus yelkouan</strong></td>
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<td><strong>Hydrobates pelagicus</strong></td>
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<tr>
<td><strong>Phalacrocorax aristotelis desmarestii</strong></td>
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<tr>
<td><strong>Larus audouinii</strong></td>
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**Key**

- Blue: Egg laying/Incubation period
- Green: Hatching period
- Yellow: Nestling period
- Red: Fledging
Appendix 10.5: International and European legislation for the protection of the marine environment

Marine Environment and the Nature Directives

The Birds and Habitats Directives

The two key pillars of the EU’s nature conservation policy are the Birds Directive (Council Directive 79/409/EEC on the conservation of wild birds, as amended by Directive 2009/147/EC) and the Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora). The Birds Directive is the EU’s oldest nature legislation tool, and its focus is exclusively on birds. The Habitats Directive complements the Birds Directive by extending the legal protection to animals other than birds, to plants and to communities of plants forming typical and recognisable habitats. Together, these two Directives have been successful in slowing down the loss of biodiversity within the EU.

The Birds Directive protects all wild birds in the European territory of the EU Member States. It requires special measures, especially through the establishment of Special Protection Areas (SPAs), for those birds that are most vulnerable, including migratory species. Using a combination of habitat conservation and species protection measures, the essential aim of the two Directives is to maintain, and where necessary, restore to a favourable conservation status the most valuable elements of flora, fauna and habitats in the EU. A principal tool to achieve this is the set of Natura 2000 protected areas, alongside the protection of species and habitats in the wider landscape.

The Natura 2000 protected sites network is one of the most outstanding and visible achievement of the two Directives. It now numbers more than 26,000 sites covering about 17% of the EU’s territory. There is no other region of the world that hosts a similar international system of protected areas.

Establishing the Natura 2000 Network in the Marine Environment

The Natura 2000 network might have caused some controversy amongst various interested stakeholders, however, an EU-level legal framework is essential, especially for the protection and the regulation of activities in the marine environment. This is both because nature does not recognise borders and because this helps ensure that no Member State gains a short-term economic advantage over another by destroying its environment. The Habitats and Birds Directives apply in the territorial sea, the Exclusive Economic Zone and the Continental Shelf of the Member States (definitions according to UNCLOS). Cyprus is the only EU Member State that has declared its EEZ in the Mediterranean Sea. Greece has not yet done so, although this has been an issue on the state’s agenda for some time.

The completion of the Natura 2000 network both on land and at sea is essential. Although great progress has already been made on land, there are still significant gaps at sea in this hugely important set of protected areas. The marine part of the Natura 2000 network includes a network of SPAs. These SPAs should, according to article 4(1) of the Birds Directive, be the most suitable territories in number and size for the conservation of marine birds. The species are those listed in Annex I of the Directive, as well as migratory marine birds. The criteria according to which marine SPAs are designated are described in the “Guidelines for the establishment of the Natura 2000 network in the marine environment. Application of the Habitats and Birds Directives” and are equivalent to marine IBA selection criteria (Chapter 1, Chapter 4, Appendix 10.1). According to the European Court of Justice (ECJ), it is only ornithological criteria that should be applied in order to delineate the most suitable sites for the conservation of wild birds. These criteria have been elaborated in the Important Bird Area Inventory, which, according to the ECJ, is the only document containing scientific evidence making it possible to assess whether the Member State complies with Article 4(1). Thus the present publication is exactly this scientific document based on which the Greek relevant authorities can designate marine SPAs.

Protection and conservation measures for marine SPAs

Once the marine SPAs have been designated by the Greek authorities, the provisions of Article 6 (para 2, 3, 4) of the Habitats Directive apply.

1 Adapted from BirdLife International (2009) EU Birds and Habitats Directives Leaflets: “What are the Birds and Habitats Directives”. Also in Greek: http://ornithologiki.gr/page_in.php?sid=63

2 European Commission (2007), Guidelines for the establishment of the Natura 2000 network in the marine environment. Application of the Habitats and Birds Directives. para.2.6.2
3 European Commission (2007), Guidelines for the establishment of the Natura 2000 network in the marine environment. Application of the Habitats and Birds Directives. para.2.5
4 Case C-3/96, Commission vs. Netherlands
Article 6 defines how these sites are protected and outlines a procedure that is to be followed when new development is planned in a site. Furthermore for each marine SPA, the relevant Greek authorities will establish the necessary conservation measures to ensure the favourable conservation status of the species and habitats for which the SPA is designated, as it has been completed for the terrestrial SPAs.

**International Marine Legislation**

**The United Nations Convention on the Law of the Sea**

The first international legislative tool that included provisions for the environmental protection of the marine environment, even though substantially weak, was the United Nations Convention on the Law of the Sea (UNCLOS), signed in 1982. Part XII of UNCLOS is dedicated to the “protection and preservation of the marine environment” and in Part IX the Convention specifically emphasises the cooperation between sovereign states with regards to enclosed and semi-enclosed seas. The Mediterranean is one such sea; including the sub-regions of the Aegean and the Ionian Sea. The emphasis on environmental protection in those regions is not referred to *verbatim*, but through the management and conservation of natural marine resources. Specific protection measures in an area with two or three sovereign states may become a complicated issue, especially for Greece and even more so for the Aegean Sea. The article 123 of the UNCLOS encourages cooperation between states that have coastline to the same sea, but does not oblige them to cooperate. The Aegean is one of the most sensitive sub-regions of the Convention because of its high navigational activity and enclosure (Tsaltas 2008); therefore trans-state cooperation is paramount.

**The Barcelona Convention**

On a regional level, the first-ever Regional Seas Programme under UNEP’s umbrella was the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Barcelona Convention) of 1976, amended in 1995. The Convention aims, through seven binding protocols, to reduce pollution and protect the marine environment in the Mediterranean region and its main goals include, among others, “protecting the marine environment and coastal zones through prevention and reduction of pollution”. The binding protocols make up a comprehensive legal framework, called the Mediterranean Action Programme (MAP).

Even though initially the MAP had a very strong focus on marine pollution control, as did the UNCLOS, over the years its goals widened towards a more biodiversity-focused approach, for example it included coastal zone planning and management. Twenty two states, including the EU and all Mediterranean countries, like Greece, are signatories to the Convention. Greece plays a major role in the implementation of the most recent technical instrument, the Integrated Coastal Zone Management Protocol (ICZM), created in Madrid in 2008, because of the country’s impressively long coastline.

The creation of protected areas in order to achieve conservation objectives has been in the Convention’s agenda since its early stages. Specially Protected Areas of Mediterranean Importance (SPAMI) are sites “of importance for conserving the components of biological diversity in the Mediterranean” and were created under the 1995 Protocol Concerning Mediterranean Specially Protected Areas and Biological Diversity in the Mediterranean, as part of the MAP. Greece has not identified any SPAMI within its territory.

Linked to the aims of the Barcelona Convention is the recently launched Union for the Mediterranean (UfM) in 2008, a multilateral partnership with less of a focus on the conservation of the marine environment. The UfM constitutes a framework for political and economic relations between the European Union and the Southern and Eastern Mediterranean Countries with goals partly similar to the Convention. Most important in terms of the marine environment is its 2020 goal to “de-pollute the Mediterranean”.

**The EU Marine Strategy Framework Directive**

The EU Marine Strategy Framework Directive (MSFD) (Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy, EEL 164 of 24/6/2008) is a continuation and development into a legal instrument of the 2005 European Marine Strategy which aimed to protect Europe’s seas. It established a framework inside which all Members States are required to take all appropriate measures in order to achieve or maintain ‘good environmental status’ (GES) of Europe’s seas by 2020, at the latest.

After several years of intensive efforts from an NGO coalition, which included BirdLife International, the MSFD entered into force on 15 July 2008. Member States must now develop and implement Marine Strategies on a national level. These must not stop at protecting and preserving the marine environment, but go as far as preventing deterioration and,
where practicable, restoring deteriorated marine ecosystems. However, it is unfortunate that the MSFD allows Member States to avoid taking action to achieve ‘good environmental status’ where ‘the costs would be disproportionate’.

As far as human activities and projects are concerned, Member States must ensure that they do not compromise ‘good environmental status’. This becomes evident by the continued marine environment’s capacity to function and provide necessary human resources. In addition, Member States are encouraged to integrate marine environment issues into all sectoral policies, such as fisheries policy, which may have an impact on the marine environment.

Member States have these obligations towards the EU, however the Directive cannot succeed without fruitful cooperation from Member States that share sovereignty in specific marine regions (Tsaltas 2008). This is because the GES will be measured at the scale of Marine Regions or Sub-Regions, rather than within national boundaries.

Finally, but very importantly, the MSFD makes special reference to marine protected areas as a tool to contribute to the successful delivery of ‘good environmental status’. The present publication consists of a scientifically-sound body of work that moves forward the implementation of the MSFD.

**Safeguarding the marine environment in Greece**

Greece transposed the MSFD into national legislation in 2011, with Law 3983/2011. More specifically, Greece’s subregions are part of the Mediterranean Sea marine region. These are (according to article 5, L. 3983/2011) the Adriatic Sea, the Ionian Sea and Central Mediterranean and the Aegean Sea and Eastern Mediterranean (Levantine Sea). Therefore, as it is evident, the Greek authorities need to work closely with neighbouring countries in order to ensure a ‘good environmental status’ in all three sub-regions. Moreover, within the Framework of the Marine Strategy for the Adriatic Sea and the Ionian Sea (part of the EC Marine Strategy), Greece has committed to develop a specific Action Plan for these subregions, which will aim to set innovative actions to be implemented through close cooperation between states.

In the next decade Greece is to carry out several steps for the implementation of the MSFD. These milestones can be summarised as follows:

- **2012** - Completion of the initial assessment of the environmental status of our waters (EC is awaiting all Member States, Greece has submitted within the deadline)
- **2012** - Define ‘good environmental status’ (GES) for the greek marine subregions and set targets and indicators to achieve it
- **2013** – Greece publishes information about marine protected areas (MPAs). The present edition represents the most significant and scientifically sound effort to collect, organise, evaluate and propose MPAs for seabirds.
- **2014** – The European Commission completes the Progress Report on MPA designation
- **2014** – Monitoring programmes are established
- **2015** – Programmes of measures to achieve GES are drafted
- **2016** – Programmes of measures are operating
- **2019** – Programmes of measures are operating
- **2020** – GES in Greece is achieved, maintained or not achieved

The national body responsible for the implementation of the MSFD is the National Committee for Marine Environment Strategy. The Committee will coordinate all relevant authorities.

**Connecting the Marine Strategy Framework Directive with the Birds and Habitats Directive**

The designation of marine IBAs is one of the most effective tools to connect and make use of the benefits of both the MSFD and the Nature Directives. The Directives and the MSFD are complementary in cases where there is substantial scientific evidence available to use for the designation of MPAs and the tool of the ‘favourable conservation status’ can be used as an indicator for the GES. There is therefore an opportunity to achieve an integrated approach for the protection of the marine environment. Up to date there are 3,100 km² of Greek waters designated as protected areas under European legislation. However, 55% of the existing marine Natura 2000 network is not protected under Greek national law, as there are no management bodies or national parks as well as no management measures applied in these areas.

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7 Ministerial Decision 1175/2012 (ΦΕΚ 2939Β/02.11.2012) indicators for each marine subregion

Appendix 10.6: Glossary and abbreviations

Abbreviations

n.m. = nautical miles
IBA = Important Bird Area
marine IBA = marine Important Bird Area
pairs = breeding pairs

Glossary

**Biodiversity**: the diversity of living beings on all levels, genes, individual populations and species, up to species and ecosystems.

**Bootstrapping**: in statistics, it refers to a resampling method for determining accuracy of sample estimates.

**Breeding success**: parameter used to interpret reproductive activity. Usually it expresses the number of young produced by a reproductive pair of animals per reproductive effort (period).

**Cetaceans**: order of aquatic mammals, which includes dolphins and whales. They are characterised by their hydrodynamic form, absence of hair, the transformation of their forelimbs into flippers with no visible external digits, the absence of hind limbs and the presence of a horizontal tail fin which is used for propulsion. The skull is modified with nasal openings far back on the dorsal surface.

**Chasmophytic**: vegetation comprising of species (chasmophytes) adapted to life on steep cliffs, thus able to develop in the minimum soil quantities present in rock fissures and to cope with strong winds due to their strong root system.

**Coastal**: the terrestrial and marine zone close to the shore.

**Colony**: concentration of organisms of the same species, which live together constantly or for a specific period of time (e.g. during reproduction). This type of aggregation provides advantages such as protection from predators and reproductive pair formation.

**Competition**: interaction between individuals of the same or different species, which has negative effects for the survival of all involved. Competition can be direct or indirect and usually results in spatial, time and ecological separation of the competitors.

**Congregatory species**: species from a variety of families, many migratory, which congregate at specific sites at some stage of their life cycles, both during the breeding and the non-breeding season. Congregation is particularly common in waterbirds and seabirds and provides ‘safety in numbers’ from natural predators, but can also increase vulnerability to site-based threats. Loss or degradation of these key sites may affect a high proportion of the global population with significant impacts.

**Continental shelf**: that part of the sea floor surrounding a landmass which descends gently from the coast till the point of shelf break (i.e. where the sea floor starts descending steeply to the sea bottom). The continental shelf usually extends to depths of up to about 200 m.

**Convex hull**: (or convex envelope) of the buffers along the coast is the smallest single convex polygon that contains these buffers.

**Data-logger**: a small, battery powered, portable electronic device that records various data, such as location, speed, temperature, etc. Devices of this type are specifically designed and mounted on birds in order to retrieve data of their movements and behaviour.

**Distribution**: the total number of geographical regions in which a species occurs, its range.

**Ecosystem**: a natural unit consisting of the living (organisms) and non-living (abiotic) parts of an area, which interact among themselves and the environment in a way that allows the flow of energy between them.

**Endemic**: every taxonomic group (genus, species, subspecies, etc.) with a distribution confined to a specific geographical area. For example, a species can be endemic to Europe or to Greece or to one island alone. Since endemic species and subspecies exist only in this area, they are threatened and must be protected, although their population might be large locally.

**ESAS method**: European Seabirds At Sea (ESAS) method is a standard method of recording seabirds at sea, developed by the European Seabirds at Sea Group. A relevant ESAS database, hosted by the Joint Nature Conservation Committee (JNCC) and seabird researchers holds more than 3 million records of seabirds collected from boat-based surveys from ships and aircraft since 1979 following this standardised method.

**Eutrophic**: rich in organic and mineral nutrients to support plant life. Eutrophication of an aquatic system occurs when high concentrations of nutrients, such as nitrates and phosphates, are added through natural or artificial sources. This usually leads to excessive algal growth. When algae die, they decompose leading to oxygen depletion of the water with negative effects for other aquatic organisms. An example of eutrophication is the “algal bloom” caused by an increase of plankton.

**Exclusive Economic Zone**: a seazone stretching from the seaward edge of the state’s territorial sea out to 200 nautical miles from its coast, prescribed by the United Nations Convention on the Law of the Sea (UNCLOS), over which a state has special rights over the exploration and use of marine resources, including energy production from water and wind.

**Fishery resources**: fish populations; term usually refers to resources available to fisheries (fish stocks).

**Fishing effort**: the effort (measured as time, labour and costs) needed by a professional fisherman in order to catch a specific quantity of fish.
Species which move in groups at regular intervals are known under a different name in each area. Migratory species are found in areas of Mediterranean climate, such as the Mediterranean shrubs with leathery leaves (sclerophyllous). They occur in evergreen vegetation characterised by tall, dense Maquis shrubs. Longline fishing involves setting longlines, depending on the fish species targeted and other factors. There are many horizontal lines upon which are tied many regularly spaced hooks. Longline fishing is used in submerged shoreline areas extending from the high water mark till permanently submerged areas.

The Littoral Zone of coasts includes the intertidal zone, extending from the high water mark till permanently submerged shoreline areas.

Overfishing is the fishing intensity, which overcomes the ability of the marine environment to recover to its natural state.

The Palaearctic is the largest of the 8 zoogeographical zones dividing the Earth's surface. It includes Europe, Asia north of the Himalaya foothills, northern Africa, and the northern and central parts of the Arabian Peninsula. The Western Palaearctic comprises the regions of Northern Africa, Europe and Asia, west of the Urals.

Passage visitor is a species known or thought to occur regularly in an area during a relatively short period(s) of the year on migration between breeding and non-breeding ranges.

Pelagic refers to aquatic organisms and habitats of the open marine waters occurring in the water column (i.e. from the surface till just-above the seabed) but which are not associated with the benthic environment.

Phenology is the study of periodic plant and animal life cycle events and how these are influenced by seasonal and inter-annual variations in climate, as well as habitat factors. In seabirds, phenology describes the occurrence of different biological events such as dates of arrival to colonies, incubation dates, etc.

Phrygana is a type of vegetation comprising of low, spiny, semicircular shrubs, sparse to dense. It can be found in a great variety of habitats in the Mediterranean and consists mostly of xerophytic species (i.e. those adapted to conditions of drought and scarcity of nutrients).
**Posidonia beds**: meadows created by the sea grass *Posidonia oceanica*, an endemic plant of the Mediterranean. Posidonia beds have a complex structure and constitute a rich biotope for a number of animal and plant organisms which breed and find refuge within them. They develop in shallow and well oxygenated waters. They are ecosystems of great importance to the coastal areas of the Mediterranean and are protected.

**Predation**: the interaction between species (usually animals) during which the one (predator) feeds on the other (prey), usually killing it.

**Primary production**: the rate at which energy (organic compounds) is produced by plants and other autotrophic organisms from atmospheric or aquatic carbon dioxide is called primary productivity. Almost all life on earth is directly or indirectly reliant on primary production. Primary producers or autotrophs, form the base of the food chain and are mainly plants and algae.

**Procellariiformes**: an Order of seabirds comprising of four families: albatrosses, petrels and shearwaters, storm petrels, and diving petrels. They are almost exclusively pelagic, colonial, monogamous seabirds, coming to land only to breed. Three species occur in Greece, Cory’s Shearwater, Yelkouan Shearwater and European Storm-petrel all of which nest in natural crevices and burrows on remote islets which are free from rodents and other predators. Procellariiformes are one of the most endangered bird taxa, many of which are threatened with extinction. In 2001 the Agreement on the Conservation of Albatrosses and Petrels (ACAP) was signed between scientists, conservationists, fishermen and governments to help address threats posed to them, such as introduced predators on their breeding colonies, marine pollution and by-catch.

**Raft**: large congregations formed by Procellariiformes on the sea surface at close proximity to the breeding colonies during the late afternoon and at dusk prior to their entry in the colony. Raft counts provide rough estimates of breeding colony size.

**Ramsar Convention**: Convention for the protection of Wetlands of International Importance which took its name from the city of Iran in which it was signed in 1975.

**Resident**: a species that remains in its region of reproduction all year round.

**SAC**: Special Area for Conservation is a designation under the ‘Habitats Directive’ (Council Directive 92/43/EEC) for the protection of animals other than birds, plants and to plant communities forming typical and recognizable habitats. Together with Special Protection Area (SPAs) they form the Natura 2000 network of protected sites across the EU.

**SPA**: Special Protection Area is a designation under the ‘Birds Directive’ (Council Directive 79/409/EEC on the conservation of wild birds, as amended by Directive 2009/147/EC) aiming to safeguard the habitats of migratory birds and certain particularly threatened birds. Together with Special Areas of Conservation (SACs), the SPAs form the Natura 2000 network of protected sites across the EU.

**Subspecies**: subdivision of the species in geographical populations, which exhibits morphological and other differences. Although, reproduction between subspecies is feasible (offspring viable), it is usually hindered due to the geographical distribution of the subspecies. Many subspecies present transition stages in the creation of new species.

**Sustainable development**: development that meets the needs of the present without compromising the ability of future generations to meet their own needs

**Sustainable**: that which meets the needs of the present without compromising the ability of future generations to meet their own needs

**Taxonomy**: the classification of organisms into taxonomic groups, such as species, genus, families, orders, classes, phylum, etc., according to their phylogenetic relationships (i.e. reflecting their evolutionary history).

**Threatened species**: a species which is threatened with extinction. Its survival is uncertain if the aggravating parameters persist.

**Upwelling**: an oceanographic phenomenon whereby cooler, nutrient-rich water moves towards the ocean surface stimulating primary productivity while warmer, usually nutrient-depleted surface water moves down. Upwelling zones are identified by high phytoplankton biomass, cool sea surface temperatures (SST) and high concentrations of chlorophyll-a and high fishery production.
Appendix 10.7: Scientific names of other species mentioned in the texts

<table>
<thead>
<tr>
<th>Common name</th>
<th>Scientific name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Striped Dolphin</td>
<td><em>Stenella coeruleoalba</em></td>
</tr>
<tr>
<td>Common Bottle-nosed Dolphin</td>
<td><em>Tursiops truncatus</em></td>
</tr>
<tr>
<td>Short-beaked Common Dolphin</td>
<td><em>Delphinus delphis</em></td>
</tr>
<tr>
<td>Cuvier’s Beaked Whale</td>
<td><em>Ziphius cavirostris</em></td>
</tr>
<tr>
<td>Sperm Whale</td>
<td><em>Physeter macrocephalus</em></td>
</tr>
<tr>
<td>Risso’s Dolphin</td>
<td><em>Grampus griseus</em></td>
</tr>
<tr>
<td>Harbour Porpoise</td>
<td><em>Phocoena phocoena</em></td>
</tr>
<tr>
<td>Fin Whale</td>
<td><em>Balaenoptera physalus</em></td>
</tr>
<tr>
<td>Mediterranean Monk Seal</td>
<td><em>Monachus monachus</em></td>
</tr>
</tbody>
</table>

**Mammals**

**Sea Turtles**

<table>
<thead>
<tr>
<th>Common name</th>
<th>Scientific name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loggerhead Turtle</td>
<td><em>Caretta caretta</em></td>
</tr>
<tr>
<td>Green Turtle</td>
<td><em>Chelonia mydas</em></td>
</tr>
</tbody>
</table>

**Birds**

<table>
<thead>
<tr>
<th>Common name</th>
<th>Scientific name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eleonora’s Falcon</td>
<td><em>Falco eleonorae</em></td>
</tr>
<tr>
<td>Peregrine Falcon</td>
<td><em>Falco peregrinus</em></td>
</tr>
<tr>
<td>Long-legged Buzzard</td>
<td><em>Buteo rufinus</em></td>
</tr>
<tr>
<td>Bonelli’s Eagle</td>
<td><em>Aquila fasciatus</em></td>
</tr>
<tr>
<td>Hooded Crow</td>
<td><em>Corvus corone corvix</em></td>
</tr>
</tbody>
</table>
## Appendix 10.8: List of photographers

<table>
<thead>
<tr>
<th>Photographers</th>
<th>In page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yiannis Barberis</td>
<td>123</td>
</tr>
<tr>
<td>Andrea Bonetti</td>
<td>cover bottom, 20, 48 middle, 84 middle, 165 bottom</td>
</tr>
<tr>
<td>Aris Christidis</td>
<td>cover up left, XII, 12, 22, 23, 26, 27, 28, 30, 51, 54 top, 82 bottom, 85, 87, 90, 122 bottom, 126, 132 bottom, 172, 176</td>
</tr>
<tr>
<td>Panos Dendrinos</td>
<td>207 left</td>
</tr>
<tr>
<td>Angelos Evangelidis</td>
<td>29, 34, 104</td>
</tr>
<tr>
<td>Yiannis Foufopoulos</td>
<td>181</td>
</tr>
<tr>
<td>Kostas Gaganis</td>
<td>82 top, 102, 114, 119</td>
</tr>
<tr>
<td>Yiannis Gavala</td>
<td>179, 180</td>
</tr>
<tr>
<td>Alexis Hatzidakis</td>
<td>135</td>
</tr>
<tr>
<td>Apostolos Kaltsis</td>
<td>XI, 11 and 157</td>
</tr>
<tr>
<td>Giorgos Karris</td>
<td>84 bottom, 92, 140</td>
</tr>
<tr>
<td>Thanos Kastritis</td>
<td>cover up right, 24</td>
</tr>
<tr>
<td>Panagiotis Latsoudis</td>
<td>cover up middle, 100 top, 100 bottom, 105, 163, 165 top</td>
</tr>
<tr>
<td>Dionysis Mamasis</td>
<td>88</td>
</tr>
<tr>
<td>Yiannis Markianos</td>
<td>31, 173</td>
</tr>
<tr>
<td>Maria Panagiotopoulou</td>
<td>i</td>
</tr>
<tr>
<td>Angelos Papastefanou</td>
<td>49</td>
</tr>
<tr>
<td>Danae Portolou</td>
<td>50, 54 bottom right, 55 bottom right, 162</td>
</tr>
<tr>
<td>Yiannis Rousopoulos</td>
<td>136</td>
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<tr>
<td>Tasos Sakoulis</td>
<td>113</td>
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<tr>
<td>Victoria Saravia</td>
<td>19, 32, 36, 37, 39, 45, 48 top, 53, 54 bottom left, 139, 148, 166</td>
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<tr>
<td>Lila Simitzi</td>
<td>25</td>
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<tr>
<td>Roula Trigou</td>
<td>40, 80, 98, 122 top, 127, 129, 130, 155, 170, 207 right</td>
</tr>
<tr>
<td>Margarita Tzali</td>
<td>41</td>
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<tr>
<td>Georgia Valaoras</td>
<td>133</td>
</tr>
<tr>
<td>Carlota Viada Sauleva</td>
<td>33, 55 bottom left</td>
</tr>
</tbody>
</table>
The present publication provides the first inventory of Important Bird Areas for seabirds (marine IBAs) in Greece and comprises one of the main results of the LIFE-Nature project “Concrete conservation actions for the Mediterranean Shag and Audouin’s Gull in Greece, including the inventory of relevant marine IBAs” (LIFE07 NAT/GR/000285). The project was implemented by the Hellenic Ornithological Society in collaboration with the Hellenic Society for the Study and Protection of the Monk Seal (MOM), the Hellenic Centre for Marine Research, the Technological Educational Institution of the Ionian Islands and the Portuguese Society for the Study of Birds (SPEA/BirdLife Portugal), with the financial support of the European Commission and the co-financing of the A.G. Leventis Foundation.

The complete identification process is described, leading to the designation of 41 marine IBAs in Greece, with the ultimate goal to promote and contribute to the conservation of seabirds and their habitats in Greece. This book also summarizes the knowledge acquired by the Hellenic Ornithological Society during the past two decades of continuous study of seabirds in the Aegean and Ionian Sea.

www.ornithologiki.gr/en/seabirds