

Species Action Plans for the conservation of seabirds in the Mediterranean Sea: Audouin's gull, Balearic shearwater and Mediterranean shag*

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SUMMARY: BirdLife International has so far developed Action Plans for 37 bird species. The plans, although not legally binding, have been approved by the Ornithological Committee (EU DG Environment) and most of them have also been endorsed by the Standing Committee of the Bern Convention. Three of the species covered by the SAPs are Mediterranean seabirds: Audouin's gull (*Larus audouinii*), Balearic shearwater (*Puffinus mauretanicus*) and Mediterranean shag (*Phalacrocorax aristotelis desmarestii*). The documents, which have been produced through a participatory process involving tens of experts across the range of the taxa, provide information on the biology, ecology and threats, but the most important feature is the list of specific objectives and actions which are ranked according to their priority and urgency. Alongside actions addressing species-specific conservation needs, such as site protection and management, a number of activities aimed at the conservation of these species are common and refer to wide policies such as land-use planning, fishery, tourist development and pollution control. The documents represent the most up-to-date and scientifically-based source of information for planning and implementing conservation activities across the Mediterranean, to be implemented by both governmental and non governmental organisations.

Key words: Audouin's gull, Balearic shearwater, shag, Action Plan, conservation, Mediterranean.

RESUMEN: PLANES DE ACCIÓN PARA LA CONSERVACIÓN DE AVES MARINAS EN EL MEDITERRÁNEO: GAVIOTA DE AUDOUIN, PARDELA BALEAR Y CORMORÁN MOÑUDO DEL MEDITERRÁNEO. – BirdLife International ha desarrollado hasta la fecha planes de acción para 37 especies de aves. Los planes, aunque no son vinculantes, han sido aprobados por el comité Ornithológico de la Unión Europea y la mayor parte de ellos ha sido ratificados por el comité permanente de la convención de Berna. Tres de las especies que cuentan con planes de acción son aves marinas: la gaviota de Audouin (*Larus audouinii*), la pardela balear (*Puffinus mauretanicus*) y el cormorán moñudo del Mediterráneo (*Phalacrocorax aristotelis desmarestii*). Los documentos, generados a través de un proceso participativo en el que han colaborado decenas de expertos, proporcionan información sobre la biología, ecología y amenazas de las especies aunque el aspecto más importante es el listado de objetivos específicos y acciones que aparecen ordenadas según prioridad y urgencia. Los planes sugieren acciones de amplio espectro, comunes a todas las especies, tales como una correcta ordenación territorial, de la pesca, del desarrollo turístico y el control de la contaminación, junto con acciones referentes a las necesidades de conservación de cada especie, tales como protección y gestión de los lugares de cría. Estos documentos representan la fuente de información más actualizada y con más base científica de que disponemos para llevar a cabo acciones de conservación en el Mediterráneo por parte de las organizaciones gubernamentales o no gubernamentales.

Palabras clave: gaviota de Audouin, pardela balear, cormorán moñudo, planes de acción, conservación, Mediterráneo.

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INTRODUCTION: THE CONSERVATION STRATEGY OF BIRDLIFE INTERNATIONAL

BirdLife International Strategy is based on 4 pillars: species, sites, habitat and people.

The 'Species' pillar has been developed through the identification of the priority species at a global level (Collar *et al.*, 1994, BirdLife International, 2000), and at a European level (Tucker and Heath, 1994). For all priority species in Europe (SPEC 1 see below) Species Action Plans have been produced. The 'Site' work has led to the identification of 3,619 IBA in Europe (Heath and Evans, 2000) and it is currently under development in Africa (with 4 national inventories already produced), Asia and the Americas. 'Habitat' work covers a wide range of activities from actions upon the EU policies (Agriculture, Rural development, Forestry, etc.) to activities at a national level or demonstration projects based on conservation strategies, as in the publication "Habitat for birds in Europe" (Tucker and Evans, 1997). 'People', our last but not least pillar, includes communication, awareness and development of the partnership, which currently covers more than 100 countries or territories world-wide.

The four pillars are of course tightly connected and the conservation of congregatory species necessarily involves the conservation of key sites, while dispersed species are better conserved by a habitat-oriented approach. Often the two go together since many species can fall into both categories at different times of the year. This is typically the case of seabirds, which are concentrated during breeding but are less so outside breeding time and sites.

THE SPECIES PROGRAMME

Following the identification of the globally threatened species, a survey of the conservation status of 514 European species led to the identification of 278 Species of European Conservation Concern (SPEC), which have been ranked in 4 classes (Tucker and Heath, 1994).

For 23 globally threatened species (SPEC 1), BirdLife International has developed Species Action Plans which have been approved by the Ornithological Committee (EU DG Environment) and endorsed by the Bern Convention Standing Committee and by the Bonn Convention and published by the Council of Europe (Heredia *et al.*, 1996). Subsequently 24 further Species Action Plans or Management State-

ments have been produced to cover the whole list of species (SPEC 2 and 3) and subspecies which have been identified by the Ornithological Committee as priority for funding under the LIFE Nature instrument.

Three of the species covered by the SAPs are Mediterranean seabirds: Audouin's gull (*Larus audouinii*) [SPEC 1], Balearic shearwater (*Puffinus mauretanicus*) and Mediterranean shag (*Phalacrocorax aristotelis desmarestii*). Each action plan was based on the inputs from a workshop with the participation of experts from the European range states and 2-3 drafts were circulated to a wide audience from the research and conservation community.

THE ROLE OF THE SAPS

1. Action Plans provide a framework for action for governments and national governmental agencies, BirdLife partners, other NGOs and scientists.

2. Action Plans, endorsed through intergovernmental agreements, provide an official basis for actions.

3. Action Plans are a reference for fundraising.

The plans are intended as tools to identify priority measures for conservation action to halt and restore the populations of the most endangered bird species in Europe, and should assist EU member states in fulfilling their obligations under the Birds Directive.

STRUCTURE OF THE ACTION PLANS

Each plan consists of three main sections. Part 1 deals with background information about status, ecology, threats and current conservation measures. Threats have been rated according to the following categories:

- Critical, a factor that could lead to the extinction of the species or sub-species in 20 years or less.
- High, a factor that could lead to a decline of more than 20% of the population in 20 years or less.
- Medium, a factor that could lead to a decline of less than 20% of the population in 20 years or less.
- Low, a factor that is only likely to affect the species or sub-species at a local level.
- Unknown, a factor that is likely to affect the species or sub-species but it is unknown to what extent.

Part 2 includes the aims and generic objectives of the plan. The objectives are grouped under the fol-

TABLE 1. – Overview of the threats according to the Species Action Plans.

Threats and limiting factors	Audouin's gull	Balearic shearwater	Mediterranean shag
Habitat alterations at breeding sites (Lack of protection)	High	High	Medium, locally high
Lack of nesting habitat		Unknown	
Changes in fishing practices	High		
Over-fishing		High	Unknown
Accidental catches		Low	Unknown, locally high
Depletion of food resources by river "regulation"	Unknown, potentially high		
Competition with the Yellow-legged Gull	Locally high	Unknown	Unknown
Competition with other species		Unknown	
Predation by other introduced mammals (rats, cats, stray dogs, etc)	Locally high	High	Unknown
Egg collection, and human persecution	Low	Low, locally high	Low
Human disturbance	Low	Low	High
Oil spills	Unknown	Potentially high	High
Pollution	Unknown	Unknown	Unknown

lowing headings:

- Policy and legislation
- Species and habitat protection
- Monitoring and research
- Public awareness.

Each objective is broken down into a series of actions followed by a brief description. These actions are generic and do not make reference to any particular country or geographical region except in special cases. Each action is given a priority rating and a time-scale in which it ought to be carried out using the following categories:

- Essential, an action that is needed to prevent a large decline in the population which could lead to the species or sub-species extinction
 - High, an action that is needed to prevent a decline of more than 20% of the population in 20 years or less
 - Medium, an action that is needed to prevent a decline of less than 20% of the population in 20 years or less
 - Low, an action that is needed to prevent local population declines or that is likely to have only a small impact on the population across the range
- Time-scale:
- Immediate, completed within the next year
 - Short, completed within the next 1-3 years
 - Medium, completed within the next 1-5 years
 - Long, completed within the next 1-10 years
 - Ongoing, an action that is currently being implemented and should continue
 - Completed, an action that was completed during preparation of the AP

Priority actions for most countries within the species range, cross-referenced to the numbered objectives, are listed in an annex to each plan to act as a guide for the preparation of national action plans.

THE SPECIES ACTION PLANS FOR AUDOUIN'S GULL, BALEARIC SHEARWATER AND MEDITERRANEAN SHAG

Threats and limiting factors

Main threats and limiting factors identified in the action plans are summarised in Table 1. Although there are differences in the biology and distribution of these three species, a number of threats are common. Houses, hotels and marinas for tourism are spreading in many areas occupied by the species and can destroy the habitat as well as increase disturbance during the breeding season. For the Balearic shearwater historical and paleontological records suggest that the species was breeding in sites that have been abandoned and possibly the lack of breeding sites is a limiting factor. Food availability is considered a major cause of population fluctuations and mobility of seabirds (Hunt, 1972; Springer *et al.*, 1986). The increase in numbers at the Audouin's gull colony in the Ebro delta is apparently linked to the exploitation of fish waste dumped from boats fishing nearby (Beaubrun, 1983; Oro and Martínez-Villalta, 1994). The industrial use of fish waste to produce animal food, as occurs in other areas of the Mediterranean, could pose a great and immediate threat to the maintenance of the colony at the Ebro delta, which relies largely on this food resource. Data about accidental capture of seabirds in long lines and fishing nets is scarce. In the Balearic Islands the accidental bycatch seems to affect *Puffinus* less than *Calonectris*. Some fishing methods such as gill nets and fish traps, particularly when located permanently close to the sea shore, are responsible for killing significant numbers of Mediterranean shags, as has been reported in

Balearic Islands (Aguilar, 1991). Interaction with the yellow-legged gull (*Larus cachinnans*) has been recognised as a limiting factor for Audouin's gull in several Mediterranean colonies. This includes competition for nesting sites and predation of eggs (Oro and Martínez-Villalta, 1994b) and predation of nestlings and adults (Bradley, 1986; Monbailliu and Torre, 1986).

In 38 colonies of Balearic shearwaters studied, significant trends have been found, suggesting that there is competition for nest cavities and that Cory's shearwater (*Calonectris diomedea*) is dominant (Capellà, 1988).

Predation of chicks and eggs by rats is well documented for Mediterranean shearwater (*Puffinus yelkouan*) (Fernandez, 1979; Mayol, 1986). Balearic shearwaters breed on many islets colonised by rats, often with medium or high breeding success. Probably the effect of rat predation is more important on the smaller islets, where rodents reach higher densities. Stray cattle and dogs can also damage nests and young, and this is a big problem in several Italian colonies of Audouin's gull. Rats, foxes (*Vulpes vulpes*), cats and some reptiles can also pose a threat to the species.

Direct human impact such as the killing and/or collecting of eggs and chicks of Audouin's gull by local people and fishermen was formerly widespread but at present is of very little significance, although Audouin's gull eggs are still highly regarded in North Africa for confectionery. The harvesting of shearwaters was frequent until the late sixties, in Pitiusas (Ibiza and Formentera) (Mayol, 1985). Mainly the adults were collected because many pulli occupied inaccessible holes. From 2,400 to 2,700 adults per year were taken in Formentera until the 1960s. The increase in the human standard of living has resulted in a decrease in this practice, with probably fewer than 100 adults/year harvested. Although the species has been protected since the seventies, it is certain that some colonies are still harvested.

The breeding period of Audouin's gull overlaps with the tourist season on the Mediterranean coasts, and the increasing disturbance which this causes may represent a major future hazard for the species (Mayol, 1986; Thibault and Guyot, 1989) and for other syntopic seabirds. The easy accessibility of many colonies and the conspicuousness of the gulls and shag make them very vulnerable to disturbance by tourists, either by boating near the shore or by direct intrusion on the nesting areas. Birdwatching and research activities can also cause disturbance.

Illegal fishing with dynamite may be a problem locally. The use of lights for some fishing practices close to the colonies can negatively affect the behaviour of breeding Balearic shearwaters. Ambient light near important colonies can affect also adult behaviour and cause dazzling of fledglings. Mediterranean shag is a shy bird which is severely affected by frequent visits to the colonies. (Guyot, 1993). These threats are not only limited to colonies but also apply at roosting places. Despite legal protection, illegal prosecution of the Mediterranean shag is still frequent in some areas.

The high level of recorded oil pollution in the Mediterranean from incidental oil spills or illegal washing of tanks could have lethal and sublethal effects on adults and eggs through eggshell smearing. A serious oil spill during the breeding season near breeding colonies could be disastrous for Audouin's gull, while Balearic shearwaters gather in coastal areas near important harbours during moult and become very vulnerable to oil spills

Chemical contamination is heavy in Mediterranean waters and represents a serious hazard for seabirds (Lambertini and Leonzio, 1986). High levels of heavy metals and chlorinated hydrocarbons (including dioxins, coplanar PCBs and dibenzofurans) have been found in Audouin's gull samples. High mercury levels were found in chicks in Asinara (Sardinia), and for several years the colony had a very low breeding success which finally led to its total disappearance.

Actions

The full list of actions and their priorities as identified by the experts compiling the action plans are given in Annex I. More general work areas which are common for all the three species are presented in Table 2. Action plans identify the need to influence fishery activities through EU policies as well as to undertake actions at national and local levels to reduce the impact of fishing on seabird species.

International and national legislation must be strengthened in order to reduce the level of oil and chemical pollution which affects the Mediterranean basin and is known to have negative impacts on the reproduction and survival of the species. The development of National Biodiversity and, more specifically, of coastal strategies, is the basis for a sustainable development of the Mediterranean coasts. Recommendation N° 62 of the Standing Committee of the Bern Convention calls the contracting parties to

TABLE 2. – Overview of the actions identified in the Species Action Plans.

National and international legislation

Influence EU policies (fishery)
 Prevent oil spill and pollution
 Develop National Coastal Strategies
 Develop National Action Plans
 Protect the species and its habitat through national and international legislation
 Birds Directive (SPA) and Habitat directive (SIC) which will become
 Nature 2000 Network
 Barcelona Convention (MedSPA)
 Biodiversity Convention (National Strategies)
 Bern Convention (Rec. no. 62)
 Promote international co-operation

Species and habitat protection

Ensure adequate protection of the species
 Designation of key sites as Protected areas
 Undertake appropriate management
 Prevent disturbance and persecution
 Control of competitors and predators (yellow-legged gull, rats, etc.)

Research and monitoring

Develop or continue monitoring of the population
 Study population dynamics
 Habitat requirement
 Feeding ecology
 Movement
 Locate new breeding sites/wintering or passage areas
 Limiting factors
 Fishery
 Disturbance
 Competitors/predators

Public awareness

Promote exchange of information
 Awareness campaigns targeting specific groups and the general public

develop national action plans for the species as a tool for proper implementation of their conservation. Key sites, identified through the IBA programme should become part of the Natura 2000 (EU) and Emerald (Council of Europe) networks, should be declared SPAMI (Barcelona Convention), become protected areas and be properly managed to reduce disturbance predation and to stop habitat loss.

Our knowledge on the distribution, ecology and movements of the species needs to be increased in order to identify, protect and monitor all key sites. Research needs to be carried out on the impact on seabirds of a number of factors, such as fishery, disturbance, interspecific competition or predation, which have been identified as actual or potential threats.

Exchange of information among researchers and conservationists must be continued and possibly improved and the Benidorm meeting is a good example of the implementation of this objective.

Finally, local communities, as well as decision-makers, fishermen and tourists need to be made aware of the need to protect these species and their habitat through specific awareness and educational campaigns since all too often lack of knowledge is the reason for incorrect behaviour or activities.

CONCLUSIONS

The Species Action Plans provide all necessary information for planning and carrying out conservation activities for each species at all level. They are common documents which NGOs and Governmental agencies should agree to use as a base for common or co-ordinated work based on priority and urgency. They are “living documents” which provide a sound international background for developing more detailed national or local plans for actions covering all useful activities aimed at the conservation of the most endangered bird species in Europe.

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ANNEX I. – Summary of the actions identified in the Species Action Plans

Audouin's gull	priority	Balearic shearwater	priority	Mediterranean shag	priority
1.1. To influence EU fisheries policies and regulations for the benefit of biodiversity conservation in the Mediterranean	high	1.4 EU fishery policies should include considerations on seabirds, taking into account the impact on its populations.	high	1.1 To influence policies in the Mediterranean	high
1.2. To develop National Coastal Strategies	medium	1.1 To develop national coastal strategies	medium	1.2 To develop national coastal strategies	medium
				1.3 To ensure that the Mediterranean shag and its habitat receive full protection through national and international legislation.	high
1.3. To ensure that Audouin's gull and its habitat receive full protection through national and international legislation	high	1.3 To ensure the protection of the breeding habitat	high	1.3.1. To promote proper implementation of the Habitats Directive	
				1.3.2. To promote proper implementation of the Birds Directive	
				1.3.3 To encourage the establishment of buffer zones surrounding breeding areas including the adjacent sea area	
1.4. To prevent chemical pollution of the sea and oil spills	high	1.2 To prevent oil spills and chemical pollution of the sea	high	1.4 To prevent oil spills and chemical pollution of the sea	high
1.5. To promote the preparation of national action plans	high	1.5.3 Recommendation No. 62 on the conservation of regionally threatened birds in the Macaronesian and Mediterranean regions, of the Standing Committee of the Bern Convention, promotes the drafting and implementation of Action Plans for Mediterranean most threatened species that are not globally threatened.	high	1.5 To promote the preparation of National Action Plans	high
1.6. To involve international conventions in the conservation of the species and its habitat	medium	1.5 To involve international conventions in the conservation of the Balearic shearwater and its habitat	high	1.6 To involve international conventions in the conservation of the species and its habitat	medium
		1.5.1 The Barcelona Convention should seek to include all the important colonies and the areas where the species congregates in the Mediterranean SPAs.		1.6.1. The Barcelona Convention should seek to include all the important colonies and the areas where the species congregates outside the breeding season in the Mediterranean SPAs.	
		1.5.2 National strategies drawn up under the Biodiversity Convention should promote the conservation and sustainable management of coastal and island ecosystems.		1.6.2 National strategies drawn up under the Biodiversity Convention should promote the conservation and sustainable management of coastal and island ecosystems.	
		1.6. The new taxonomic status of the species must be included in future reviews of international conventions.	high		
1.7. To promote international cooperation and funding from bilateral agencies	high			1.7 To promote international cooperation and funding for research, monitoring and conservation from bilateral agencies	high
2.1. To ensure adequate protection of breeding sites and remove major threats to breeding habitat	high	2.1 To ensure adequate protection of breeding sites. All the IBAs and protected areas where Balearic shearwater occurs should include specific measures for its effective conservation.	high	2.1 To ensure adequate protection of breeding sites. All the IBAs and protected areas where shag occurs should include specific measures for effective shag protection	
2.1.1. To designate all key sites as protected areas					

ANNEX I. (Cont.) – Summary of the actions identified in the Species Action Plans

Audouin's gull	priority	Balearic shearwater	priority	Mediterranean shag	priority
2.2.2. To prevent habitat alteration at all regular breeding sites		2.1.1 Designation of all the colonies as protected areas	high	2.3 To prevent construction works and urbanisation near the breeding sites and effectively protect <i>Posidonia</i> beds in the vicinity of the colonies. 2.3.1 To prevent habitat alteration at the feeding areas	
2.2. To undertake appropriate management at breeding colonies.	high	2.1.2 To prevent human harvesting and disturbances.	medium	2.1.1 To prevent any kind of disturbance in breeding and roosting areas, and identify buffer areas on land and at sea in front of the colonies where the access of tourists should be regulated.	high
2.2.1. To prevent and reduce human disturbance	low				
2.2.3. To prevent egg-collecting					
2.2.2. To control competitors and predators and assess effectiveness of control measures	medium	2.1.3. Control of predators.	medium, locally high	2.2.2 Introduced predators such as rats, feral cats and genets should be eradicated in the colonies.	low
				2.2.3 The transportation or introduction (even temporary) of dogs or other terrestrial predators should be forbidden on the uninhabited islets where colonies and main roosting sites are located.	high
		2.2 To increase breeding numbers and breeding sites	medium		
		2.2.1. To create more available nesting sites in existing colonies	low		
		2.2.2. To encourage the establishment of new colonies.		2.2 To reduce mortality of adults and offsprings	
				2.2.1. To reduce mortality around colonies and roosting sites from fishing nets.	locally high
		2.3.3. To promote adequate fishing practices which take account of the species conservation.	high	2.2.4. Prevent fishing activities around IBAs and protected areas from negatively affecting food stocks and food availability for the species	high
2.3. To protect Audouin's gull and its habitat in the winter quarters and along the migration route					
2.3.1. To seek protection for all regular wintering sites	medium				
3.1. To set up and implement a monitoring programme		3.1. To continue the monitoring programme.	medium	3.1. To set up and implement a monitoring programme	high
3.1.1. To monitor population status and range trends	high			3.2. To undertake research on ecology	
3.3.1. To study population dynamics	high	3.3.1. Population dynamics	high	3.2.1 Population dynamics	high
3.1.2. To determine current distribution and population status	high				
3.1.3. To determine the extent and location of discrete populations	medium				
3.2.2. Feeding ecology and habitat use in winter	medium/high	3.2 To undertake research on feeding ecology over the whole species range		3.2.2. Feeding ecology and habitat use	medium
3.3.3. To determine the diet in different parts of the Mediterranean	medium	3.2.1 To identify the most important prey items and feeding sites	high		

ANNEX I. (Cont.) – Summary of the actions identified in the Species Action Plans

Audouin's gull	priority	Balearic shearwater	priority	Mediterranean shag	priority
3.2. To undertake research on dispersal patterns and winter ecology		3.2.2 Food availability monitoring.	high	3.2.3. Seasonal movements	low
3.2.1. To identify the most important passage sites and wintering areas	high				
3.3. To promote research which is directly applicable to the conservation and management of Audouin's gull		3.3 To promote studies with direct application to the conservation and management of the species			
3.3.2. To undertake comparative studies of breeding biology and colony-site selection in different habitats	medium				
3.4. To assess major threats and their effects				3.2.4 Limiting factors	
3.4.1. Chemical pollution and oil spills	medium				
3.4.2. Fishing policies	high				
3.4.3. Habitat requirements	medium				
3.4.4. Human disturbance	medium	3.3.2 Impact of human disturbance	medium		
3.4.5. Competitors	medium	3.3.3 To assess the impact of species interacting at breeding sites	low		
3.4.6. Predators	medium	3.3.4 Predators	high		
3.4.7. To monitor fishing activities for possible impact on breeding and wintering Audouin's gulls	high	3.3.5 Accidental catches	medium	3.2.5 Effect of fisheries	high
3.5. To agree a protocol for low-disturbance monitoring and research	medium				
4.3. To promote information exchange	high	4.2 To promote information exchange	high	3.3 Exchange of information	high
4.1. To provide information and increase awareness		4.1 To provide information and increase awareness on the value of the species and its habitats .		4.1 To provide information and increase awareness.	
4.1.1. To increase awareness about Audouin's gull among politicians and decision-makers	medium	4.1.2 To increase awareness of the species among politicians and decision-makers	high	4.1.2 To increase awareness on the species among politicians and decision-makers	high
4.1.3. To involve tourists and fishermen in preventing disturbance	high	4.1.1 To increase awareness among the public, especially in Pitiusas Islands.	high	4.1.1 To involve tourists, fishermen and any potential user of the areas in preventing disturbances.	high
4.1.2. To inform the general public about the plight of Audouin's gull	medium				
4.1.4. To prepare and distribute educational material	medium	4.1.3 To prepare and distribute educational material	medium	4.1.3 To prepare and distribute educational material	medium
4.1.5. To use the media to increase awareness	medium	4.1.4 Use of the media to increase awareness	medium	4.1.4 Use the media to increase awareness	medium
		4.3 To promote awareness on islands and rocky coasts of biodiversity	high	4.1.5 To promote awareness for uninhabited islets and rocky coasts.	essential
4.2. To use Audouin's gull as a flagship species	medium	4.4 To publicise the new taxonomic status	low		

