

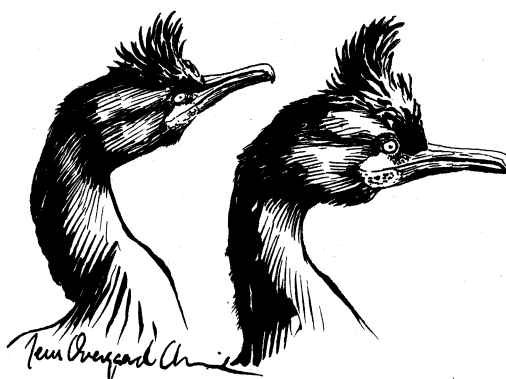
Strasbourg, 11 June 2001  
[Bern\T-PVS 2001\tpvs29e\_2001]

**T-PVS (2001) 29**

CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE  
AND NATURAL HABITATS

Standing Committee

21<sup>st</sup> meeting  
Strasbourg, 26-30 November 2001



**Action Plan for the conservation  
of Mediterranean Shag  
(*Phalacrocorax aristotelis desmarestii*)**

*Draft*

*Document*

*Prepared by BirdLife International  
on behalf of the Council of Europe  
on the basis of a document prepared for the  
European Commission*



**Compiled by:**

Juan Salvador Aguilar & Gustavo Fernández

With contributions from

T. Albayrak, (Akdeniz University, Turkey)  
H. Azafzaf (A.A.O.- G.T.O., Tunisia)  
M. Baha El Din (BirdLife International Egypt Affiliate)  
S. Baha El Din (BirdLife International Egypt Affiliate)  
T. Bino (ASPBM, Albania)  
J. J. Borg (BirdLife Malta)  
M. Charalambides (COS, Cyprus)  
J. Criado (SEO/BirdLife, Spain)  
S. Dereliev (BSPB/BirdLife Bulgaria)  
O. Dudkin (UTOP, Ukraine)  
G. Eken (BirdLife International, The Netherlands)  
K. S. Etayeb (EGA, Libya)  
U. Gallo-Orsi (BirdLife International, The Netherlands)  
P. Iankov, BSPB/BirdLife Bulgaria  
P. Isenmann (CEFE/CNRS France)  
S. Karauz, (General Directory of National Parks and Game-Wildlife, Turkey)  
I. Kostadinova (BSPB/BirdLife Bulgaria)  
S. Kostin (Crimea Mountain-Forest Station, Ukraine)  
B. Kurt, (Dogal Hayati Koruma Dernegi, Turkey)  
M. McMinn (CSIC Balearic Islands, Spain)  
E. Minguez (Conselleria de Medi Ambient, Spain)  
J. Muntaner (Conselleria de Medi Ambient, Balearic Islands, Spain)  
C. Papaconstantinou (HOS/BirdLife Greece, Greece)  
X. Ruiz (Barcelona University, Spain)  
P. Yesou (ONCFS, France)

**Milestones in production of action plan**

First version: July 1999

Workshop: 3-5 September 1999

Final version: December 1999

Enlarged version: May 2001

**Reviews**

This action plan should be reviewed and updated every four years. An emergency review will be undertaken if sudden major environmental changes occur within the species range, liable to affect the population.

**Geographical scope**

This Action Plan needs to be implemented in the following range state of the Mediterranean subspecies of the Shag: Albania, Algeria, Bulgaria,, Croatia, Cyprus, Egypt, France, Gibraltar (UK), Greece, Italy, Libya, Malta, Spain, Tunisia, Turkey and Ukraine.

## Contents

Summary .....	4
Threat and limiting factors .....	4
Conservation priorities .....	4
<b>Introduction</b> .....	5
<b>Background information</b> .....	5
Distribution and population .....	5
Life history .....	6
Threats and limiting factors.....	6
Conservation status and recent conservation measures .....	7
<b>Aims and objectives</b> .....	10
1. Policy and legislation .....	10
2. Species and habitat conservation .....	12
3. Monitoring and research.....	12
4. Public awareness .....	13
<b>References</b> .....	14
Annex	
Recommended conservation actions by country.....	15

## Summary

*Phalacrocorax aristotelis desmarestii* is the subspecies endemic of the Mediterranean and the Black Sea. Its biology and population figures are not well studied. The species breeding range includes all EU Member States along the Mediterranean coast, Gibraltar (UK), Croatia, Albania, Bulgaria, Ukraine, Turkey, Cyprus, Egypt, Libya, Tunisia and Algeria.. All experts agree on the fact that its population has undergone a decrease in numbers.

The subspecies is in the Annex I of the EU's Bird Directive and the Mediterranean population of the species (*Phalacrocorax aristotelis*) is listed in Annex II of the Bern Convention.

It nests on rocky coasts and islets feeding on coastal fish. It is very sensitive to disturbance during breeding and at roosting sites.

### Threats and limiting factors

- Human disturbance - High
- Oil pollution - High
- Habitat loss - Medium\* Locally high
- Accidental catches - Unknown, locally high
- Overfishing - Unknown, locally high
- Predation by introduced mammals - Unknown
- Chemical pollution - Unknown
- Competition with other species - Unknown
- Illegal prosecution - Low

### Conservation priorities

To influence policies in the Mediterranean in order to avoid accidental catch of endangered species and coastal fish stock depletion.

To ensure that Mediterranean Shag and its habitat receive full protection through national and international legislation (Habitat & Bird Directives)

Encourage the establishment of buffer zones surrounding breeding areas including the adjacent sea area.

Prevent oil spills and chemical pollution of the sea

To promote the preparation of National Action Plans Maintain large areas of extensive arable/pastoral land and enhance habitat quality within them, through application of agri-environment policies (i.e. by increasing legume crops, unploughed fallows and set-aside fields, and by preventing irrigation, concentration of landholdings, afforestation, tree crops, pesticide application and inappropriate stocking densities) – essential

To promote international co-operation and funding for research, monitoring and conservation from bilateral agencies

To ensure adequate protection of breeding sites. All the IBAs and protected areas where Shag occurs should include specific measures its protection.

Prevent any kind of disturbance in breeding and roosting areas, and identify buffer areas on land and in at sea in front of the colonies where the access of tourists should be regulated.

To promote international co-operation and funding for research, monitoring and conservation from bilateral agencies

Prevent that fishing activities around IBAs and protected areas negatively affect food stocks and food availability for the species

Prevent habitat alteration at the feeding areas

To set up and implement a monitoring programme

To undertake research on ecology, population dynamics and limiting factors

Exchange of information and increase awareness.

## Introduction

The Mediterranean Shag *Phalacrocorax aristotelis desmarestii* is a subspecies endemic to the Mediterranean and Black Seas. Despite their numbers are not well known experts agree that a reduction of the population has taken place. It is a seabird species linked to the coast where it breeds in rocky areas. The Mediterranean population of the species is included in Annex II of the Bern Convention, and the subspecies is listed in Annex I of the Birds Directive 79/409. The species experienced catastrophic declines in many parts of its former range due mainly to agricultural intensification (e.g. Schulz, 1985, del Hoyo et al., 1996). Its most important populations are now located in the EU, mainly within the Iberian Peninsula. The available but incomplete figures suggest that 80-90% of the world population may be concentrated in Spain and Portugal.

This Action Plan relies largely on the results of a Workshop on the subspecies held in the Balearic Islands, on September 1999 and on replies to a specific questionnaire sent to all non-EU range states in 2001. The species is sedentary and partially dispersive, but generally philopatric. Only through adequate management at local level it would be possible to ensure the survival of all populations. Numbers and trends of the main colonies of the species are still unknown.

## Background information

### Distribution and population

The subspecies is endemic to the Mediterranean and Black Seas. The total population was estimated to be less than 10.000 pairs, half of them breeding in the EU (Eastern coast of Spain, Balears, Corsica, Sardinia, Tuscany archipelago, Lampedusa, Crete and islets of the Ionian sea). Very significant fluctuations in breeding numbers have been noted from year to year in several different Mediterranean colonies. Censuses are quite difficult and need to be co-ordinated for all the colonies in a given region (Guyot 1993).

Table 1 - Population figures in the Mediterranean basin. Source Guyot (1993, modified)

Country	N. of pairs	N. of colonies
Albania <sup>1</sup>	5-10	?
Algeria	40	5
Bulgaria <sup>2</sup>	80 (50 - 100)	2
Croatia <sup>3</sup>	250-300	
Cyprus <sup>4</sup>	80 - 120	8
Egypt <sup>5</sup>	tens	2-3
France <sup>6</sup>	320-375	25
Former Yugoslavia	1.500-2.000	>30
Gibraltar	5-8	1
Greece <sup>7</sup>	1000 ca.	>55
Italy <sup>8</sup>	1600 - 2000	>30
Libya	50	?
Morocco	0?	?
Spain	1.250	>30
Tunisia	50	2
Turkey <sup>9</sup>	820 - 2000	?
Ukraine <sup>8</sup>	250 - 400	5
Total	<10.000	> 195

<sup>1</sup> T. Bino (*in litt.* 2001)

<sup>2</sup> BSPB/ BirdLife Bulgaria National Bird Databank

<sup>3</sup> Crnkovic (1988)

<sup>4</sup> M. Charalambides (*in litt.* 2000)

<sup>5</sup> M. Baha El Din and S. Baha El Din (*in litt.* 2001)

<sup>6</sup> Dubois *et al.* (2000)

<sup>7</sup> C. Papacostantinou (2000, *pers. com.*)

<sup>8</sup> BirdLife International / European Bird Census Council (2000)

<sup>9</sup> Eken, G., Karauz, S. & Kiraç, C.O. (*in prep*)

## **Life history**

### *Breeding*

The species nests primarily in winter, however from year to year there seems to be a great difference in nesting periods (Guyot 1984). The laying dates range from November to March depending upon the region, and younger birds breed later, occupying sub-optimal nest sites and having lower breeding success. The commonest clutch size is three eggs and incubation lasts 30 days. The fledging of the chicks lasts for about 53 days.

### *Feeding*

The subspecies feeds mainly on coastal fishes, from bottom or mid water over rocky or sandy seabeds. The Mediterranean Shag feeds mainly by pursuit-diving, and normally alone. Economically important fish seems to form a very small part of the diet.

### *Habitat requirements*

The species has a strong preference for rocky coasts and islands. It is not normally found far from land. Roost always in the seashore on rocks and stacks. During breeding period it forms sparse colonies, nesting in crevices or caves, on ledges or amongst boulders, often a few meters above the sea level. The nest is built with a variety of vegetal materials, and is frequently reused in successive seasons.

## **Threats and limiting factors**

### *Human disturbance*

Mediterranean Shag is a shy bird which is severely affected by frequent visit to the colonies. (Guyot 1993). The increase of length of the tourist season and their activities close to the breeding sites, the development and the lack of effective protection of some important colonies can represent a critical threat. Birdwatching and research activities can also cause serious disturbance. These threats are not only limited at the colonies but also at roosting places.

**Importance: high**

### *Oil pollution*

Incidental oil spills or illegal washing of tanks are a proved threat (Lambertini & Leonzio 1986) that can have lethal and sub-lethal effects on adults and eggs through eggshell smearing.

**Importance: high**

### *Accidental catch*

Some fishing methods such as gill nets and fish traps, particularly when located permanently close to the sea shore, are responsible of the killing of a significant numbers of shags, as has been reported in Balearic islands (Aguilar 1991).

**Importance: unknown, locally high**

### *Habitat loss*

Favourable habitat (for breeding, roosting and feeding) is most often unaffected, but habitat availability for shags can locally be reduced by developments, illegal trawling, construction of ports, marinas and sea walls, uncontrolled anchoring of yachts and sand extractions for beach regeneration. The latter can strongly affect the Posidonia beds and other benthonic communities where Mediterranean Shag feeds.

**Importance: medium - locally high**

### *Illegal prosecution*

Despite legal protection, illegal prosecution of the species is still frequent in some areas.

**Importance: low**

### *Predation by introduced mammals*

It is possible that predation by rats in islets with high rodents' density would be important, but there are not enough data on the effects of predation by rats. Temporary presence of dogs may cause serious disturbances and mortality of chicks and adults.

**Importance: unknown**

### *Chemical pollution*

Levels of Hg, Se, Pb and PCBs are high in 3 studied animals, as well as contents of PCBs in two eggs reported by Lambertini & Leonzio (1986). There is no direct evidence of the impact of high concentration of mercury and other heavy metals on the species' biology in the Mediterranean. More field data are required.

**Importance: unknown**

### *Competition with other species.*

Predation and competition for nesting sites by Yellow-legged Gull is potential a problem since gull populations are increasing and many of their colonies are located close to the Shag breeding sites.

**Importance: unknown**

### *Overfishing*

Depletion of fish stocks may cause the declining of entire populations.

**Importance: unknown**

## **Conservation status and recent conservation measures**

The species is protected in all the member states of the European Union. Estimates of the total breeding population are incomplete and not globally updated since the 1980s.

### **Albania**

According to the Albanian Red Data Book the conservation status of the Mediterranean Shag remains uncertain due to data deficiency. Nevertheless observations conducted in the recent years increased the observation pressure on potential distribution areas. The species is now considered as Vulnerable (Bino *unpublished*) and it is distributed all over the Albanian coast. Key sites are Rodoni peninsula, Lagji peninsula, Vlora bay, Karaburuni peninsula, Sazani island, Ksamili islands and Stillo islands.

Protected Areas and IBAs are very likely to cover 50-70% of the Albanian population

Only half of the sites have been included in recent conservation projects. Neither has been concentrated on the species nor on its habitats

### **Bulgaria**

The species is included in the Bulgarian Red Data Book (1985) under the category 'Threatened'. It is fully protected under the Bulgarian Nature Conservation Act (1962). Special national regulation (1986, amended in 1997) envisages a fine of 50 BGL (US\$ 25) for damaging or killing individuals of this species.

It breeds on the cliffs between the Cape Kaliakra and Cape Shabla in the northern part of the Bulgarian Black Sea coastline and here the numbers meet criteria 6 of the Ramsar Convention. Outside breeding season concentrated mainly in the same area, but some birds appear or overwinter along the almost whole Bulgarian Black Sea coast (records at Cape Galata, Pomorie Lake, Sunny Beach, Krimorie and the mouth of the Ropotamo River, South of the town of Burgas).

The breeding cliffs of the species in Bulgaria are situated in an area, where the recreation pressure is increasing during the last 10 years and where development boom may appear when the country's economy became more stable. Virtually all possible forms of developing the coastline (hotel and recreation complexes, golf fields, marine sports, etc.) will destroy the breeding habitat of the Shag. The same area is one of the main Bulgarian petrol fields, not actively used at the moment, but they also may be developed at certain moment, which will be additional serious threat.

The cliffs with one of the two breeding colonies (with approximately 50% of the population) are included in the protected area Kaliakra Reserve, the second colony is unprotected. The Bulgarian Society for the Protection of Birds (BSPB) and the Bulgarian-Swiss Biodiversity Conservation

Programme are preparing a proposal for the designation of the whole area as a Nature Park (IUCN V Category). Since 1994 BSPB carries out monitoring of the winter numbers of the Mediterranean Shag along the Bulgarian part of the Black Sea coast.

### **Cyprus**

The species is resident in Cyprus and is legally protected and 90% of the colonies are within IBAs. The colonies are largely inaccessible and thus threats are limited. Colonies in the northern part of the Island need to be monitored.

### **Egypt**

The subspecies in Egypt is *desmarestii*, the same as the population in Libya to the west. According to "The Birds of Egypt" (Goodman and Meininger 1989), the species is an "accidental visitor, although possibly a rare winter visitor". Since 1990 small numbers have been found along the western Mediterranean coast of Egypt in the area from Sallum to Ras El Hekma (Baha El Din S. and Baha El Din M., in publication). Has been found on the cliffs at Sallum and small, rocky islands west of Marsa Matruh and at Ras El Hekma. There has been no conclusive evidence of breeding, however, it is presumed to be breeding as has been recorded throughout the year and local fisherman interviewed confirmed breeding on the islands.

The population is presently not protected under Egyptian law. Furthermore, while the species habitat is covered by two proposed protected areas at Sallum and Ras El Hekma, these areas have yet to be formally established. The habitat of the species is not included under any Egyptian IBAs.

### **Libya**

Information from this country is scarce. The only available population estimate was proposed by Guyot (1993). An ornithological expedition in 1993 (Meininger *et al.* 1994) recorded the species only in the Eastern part of the country where some 20 pairs were estimated to breed and were local fishermen collect juveniles for food. In July-October 1998 surveys were carried out on Farwa Island (150 Km west of Tripoli). A total of twenty five individuals were sighted during the study period resting on the elevated posidonia crust at the western corner of the island which is covered during high tide and exposed during low tide along with Lesser crested terns and Lesser black backed gulls in early part of October.

### **Malta**

The species is legally protected. *P.a.desmarestii* is a vagrant to the Maltese Islands (7 records according to Sultana, J. & C. Gauci. 1982), the only threat to individual birds is by illegal shooting when pleasure boats from Malta go to the Pelagian Islands (Italy) and possibly shoot recently fledged and adult birds while fishing offshore. The nearest breeding colony to the Maltese Islands is about 150km west of Malta on Lampedusa with an estimated 30-40 pairs (Iapichino & Massa 1989).

### **Tunisia**

The species is protected by the Hunting Law ( Arrête relatif à la chasse ). The two breeding colonies, situated on the archipelago La Galite and in the Zembra National Park, are within IBAs. Both colonies are not easily accessible and disturbance by human activities is therefore limited on few visits by pleasure boats. The part of the Zembra National Parc colony which is located on the rocky islet Zembretta is extremely threatened by rats.

### **Turkey**

The species is strictly protected by the Terrestrial Hunting Law.

In late 1960's and early 1970's, the species was proven to breed in a few locations only: Akkus Island and a mainland sea-cliff in the Eastern Black Sea region, Foça Islands in the Aegean and Tasucu Islands along the East Mediterranean coast.

Surveys after 1995 have led to locate many other breeding sites particularly in the Aegean and the Black Sea Region holding the largest colonies in Turkey of which the results have been compiled in Table 1 (Eken *et al.* in prep). It is likely that the species is less numerous in the Mediterranean and in the southernmost Aegean, although it is not possible to rule out the existence of larger colonies than



those are we currently know. Although breeding is confirmed, real size of the breeding population in the Marmara Sea is not known that might well support several breeding colonies.

The breeding population in Turkey is previously underestimated at 50-350 pairs while recent surveys indicated presence of a much larger population estimated at 810-2000 pairs.

A small proportion of sites where the species breed are protected (see Table 2).

### Ukraine

The Shag is included in the national Red Data Book (II category) and is legally protected

This subspecies prefers only rocky coasts or islands in Crimean peninsula. Birds are present at Cape Martyan and at Tarkhankut peninsula not only during the breeding season, but all year round. Main threat is habitat loss. The whole Shag populations is included or will be included in Protected Area in the nearest future.

Some of the breeding sites have been protected since the last review (Monbailliu & Sultana 1993) but many known breeding sites within the European Union lack any form of protection or their protection is not effectively implemented.

Many islets and cliffs where the species breeds are designated as SPAs, but only some colonies are located in effectively protected areas:

**Table 2** – Known colonies located inside protected areas

Site	Region	Country
Kaliakra Reserve		Bulgaria
Cerbicale islands	Corsica	France
Lavezzi Island	Corsica	France
Sanguinaires Island	Corsica	France
Scandola	Corsica	France
Northern Sporades Marine Park	Sporades	Greece
Asinara Island	Sardinia	Italy
Capo Caccia and Arca di Noe	Sardinia	Italy
Maddalena archipelago	Sardinia	Italy
Maddalena archipelago	Sardinia	Italy
Mal di Ventre islet	Sardinia	Italy
Tavolara Island	Sardinia	Italy
Cabrera archipelago	Baleares	Spain
Dragonera Island	Baleares	Spain
Esperdell Islet	Baleares	Spain
Akkus Island		Turkey
La Galite archipelago		Tunisia
Zembra National Park		Tunisia
Sile Islands		Turkey
Ayvalik Islands		Turkey
Foça Islands		Turkey
Ildir Körfezi Islands		Turkey
Çiftlikköy and Alaçati Islands		Turkey
Aydincik Islands		Turkey
Tasucu Islands		Turkey
Göksu Delta		Turkey
Kizilirmak Delta		Turkey

**Table 3-** Unprotected or insufficiently protected colonies requiring urgent conservation measures (Monbailliu & Sultana 1993 *modified*):

Capo Rosso	Corsica	France
Sanguinaires archipelago	Corsica	France
Gibraltar		Gibraltar
Capo Caccia & Punta Giglio	Sardinia	Italy
Coast and islets near Alghero	Sardinia	Italy
Corona Niedda island and S. Caterina	Sardinia	Italy
Costa Smeralda islet and Capo Figari	Sardinia	Italy
Fourni archipelago	Sardinia	Italy
Mal di Ventre islet	Sardinia	Italy
Orosei gulf and Quirra ilet	Sardinia	Italy
Rossa islet and Paradiso Coast	Sardinia	Italy
Smeralda archipelago	Sardinia	Italy
Vacca and S. Pietro islets	Sardinia	Italy
Lampedusa island	Sicily	Italy
Elba and Caparaia	Tuscany archipelago	Italy
Cap Blanc	Balearic Islands	Spain
Vlora Bay		Albania
Karamburu Peninsula		Albania
Sazan Island		Albania
Sallum		Egypt
Ras El Hekma		Egypt

## Aims and objectives

### Aims

In the short term to maintain all the current populations of the subspecies.

In the medium to long term to conserve suitable habitats in order to promote the restoration of its numbers and its distribution range.

### Objectives

#### 1. Policy and legislation

##### 1.1. To influence policies in the Mediterranean

- i. To avoid accidental catch of endangered species;
- ii. Locally avoid coastal fish stock depletion.

To enforce the implementation of existing Directives (birds and habitats) at the EU level.

Priority: high

Timescale: medium

##### 1.2. To develop national coastal strategies

All the Mediterranean countries should develop and implement coastal strategies which include integrated planning and consider development and use of the coasts in a sustainable way. Specifically for EU countries, important coastal habitats including islets and cliffs should be safeguarded.

Priority: medium

Timescale: ongoing

*1.3. To ensure that Mediterranean Shag and its habitat receive full protection through national and international legislation*

*1.3.1 To promote proper implementation of the Habitats Directive*

Annex I of the European Union's Habitats Directive includes Posidonia prairies as priority habitats and Mediterranean cliffs are also listed in the Directive. Governments should ensure that these habitats are adequately protected. All site with important habitats for Shag should be declared as SACs

The complete protection should include an adequate management of all the breeding areas in all Mediterranean countries.

Priority: high

Timescale: short/ongoing

*1.3.2. To promote proper implementation of the Birds Directive*

All IBAs qualifying for Mediterranean Shag should be declared as Special Protected Areas for Birds according to Bird Directive 79/409/CEE.

Priority: high

Time-scale: short/ongoing

*1.3.3. Encourage the establishment of buffer zones surrounding breeding areas including the adjacent sea area.*

Priority: high

Time scale: short/ongoing

*1.4. Prevent oil spills and chemical pollution of the sea*

National and international legislation on chemical pollution and industrial treatment should be enforced and appropriate action undertaken to avoid chemical/oil release from both offshore and land-based sources.

The IMO and shipping insurance brokers (Veritas, Lloyds...) should be lobbied to establish a system of incentives for those oil tanker companies which agree to avoid sensitive marine ecosystems. Heavy fines should be imposed for the cleaning of oil tankers outside the areas especially designated for that purpose.

Priority: high

Timescale: medium

*1.5. To promote the preparation of National Action Plans*

National Actions Plans for Mediterranean Shag should be prepared with the co-operation of GOs, NGOs and research institutions. Once finished, these plans should be endorsed and implemented by the national authorities for nature conservation

Priority: high

Time-scale: short

*1.6 To involve international conventions in the conservation of the species and its habitat*

*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.*

Priority: medium

Time-scale: ongoing

*1.6 2 National strategies drawn up under the Biodiversity Convention should promote the conservation and sustainable management of coastal and island ecosystems.*

Priority: medium

Time-scale: ongoing

*1.6.3 To implement recommendation No.62, of the Standing Committee of the Bern Convention on the conservation of regionally threatened birds in the Macaronesian and Mediterranean regions*

Priority: medium

Time-scale: ongoing

*1.7 To promote international co-operation and funding for research, monitoring and conservation from bilateral agencies*

About half of the subspecies' population breeds in Mediterranean countries outside the EU. Bilateral agreements for establishing protected areas and for research and monitoring of Mediterranean Shag should be promoted among governments.

Priority: high

Time-scale: ongoing

## **2. Species and habitat protection**

*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 Prevent any kind of disturbance in breeding and roosting areas, and identify buffer areas on land and in at sea in front of the colonies where the access of tourists should be regulated.

Human activities in the breeding grounds and important roosting areas should be regulated. This regulation should include the marine areas close to the colonies.

Priority: high

Time-scale: short

*2.2. To reduce mortality of adults and offsprings*

2.2.1. To reduce mortality around colonies and roosting sites from fishing nets.

Gill nets and fish traps should not be allowed close to the colonies and important roosting places.

Priority: locally high

Time-scale: short

2.2.2 Introduced predators as rats, feral cats and Genets should be eradicated in the colonies.

Priority: low

Time-scale: medium

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.

Priority: high

Time-scale: short

2.2.4 Prevent that fishing activities around IBAs and protected areas negatively affect food stocks and food availability for the species

Priority: high

Time-scale: short

*2.3. Prevent construction works and urbanisation near the breeding sites and effectively protect Posidonia beds in the vicinity of the colonies.*

Priority: medium

Time-scale: medium

2.3.1 Prevent habitat alteration at the feeding areas

Enforcement of the legal status of all the important marine communities near the important colonies should be ensured. Where full legal protection cannot be given other planning instruments should be brought into force to prevent inadequate fishing and development practices.

Priority: high

Time-scale: medium

## **3. Monitoring and research**

*3.1. To set up and implement a monitoring programme*

Detailed population surveys should be undertaken with an adequate periodicity. Special effort should be made to identify all breeding sites, important roosting sites and areas of post-breeding concentration. A co-ordinated monitoring programme should be established with the aim to update the subspecies situation in all the involved countries.

Priority: high

Time-scale: immediate

### *3.2 To undertake research on ecology*

#### *3.2.1 Population dynamics*

Factors affecting breeding success, mortality in relation with age, recruitment and the emigration/immigration rates should be determined and the mechanisms of action of those factors analysed. The results of these and another related studies should be used to build a predictive population model.

Priority: high

Time-scale: short

#### *3.2.2. Feeding ecology and habitat use*

To identify the most important preys and study foraging activity and the main foraging grounds for the most important colonies.

Priority: medium

Time-scale: long

#### *3.2.3. Seasonal movements*

To study the main movements of individuals not related to colonies exchanges.

Priority: low

Time-scale: long

#### *3.2.4 Limiting factors*

To investigate potential limiting factors and the extent to which every threat is affecting the colonies, including human disturbance. It is necessary to agree a protocol for low-disturbance monitoring and research.

Priority: medium

Time-scale: long

#### *3.2.5 Effect of fisheries*

To investigate the effect of fishing activities on Shag mortality and food availability.

Priority: high

Time-scale: short

### *3.3 Exchange of information*

Promote the exchange of information between researchers and institutions involved on Mediterranean Shag research, management or conservation.

Priority: high

Time-scale: short

## **4. Public awareness and training**

### *4.1.To provide information and increase awareness*

4.1.1 Involve tourists, fishermen and any potential user of the areas in preventing disturbances. Public awareness on the species and on the vulnerability of the colonies should be increased by specific and carefully targeted campaigns. Local authorities should also be involved and asked for legal measures for the temporary or long-term protection of breeding sites.

Priority: high

Time-scale: immediate

#### *4.1.2 Increase awareness on the species among politicians and decision-makers*

It is necessary to influence local authorities, landscape planners and others involved in decisions and activities which could have a negative influence on the conservation of the species.

Priority: high

Time-scale: immediate

#### 4.1.3 Prepare and distribute educational material

Information and educational materials should be provided to the public in areas close to the colonies, including information of the species and its habitat as well as guidelines and rules to prevent disturbance.

Priority: medium

Time-scale: short

#### 4.1.4 Use the media to increase awareness

Information on the species, its threats and the need of protection should be made available to newspapers, magazines and other media.

Priority: medium

Time-scale: short

#### 4.1.5 Promote awareness for the value of uninhabited islets and rocky coasts.

Promote the public awareness on the rocky coasts and uninhabited islets natural value as important and unique nesting areas for birds, as well as their value for plants, reptiles and other organisms.

Priority: essential

Time-scale: short

## References

- Aguilar J.S. 1991. Resum de l'Atlas d'ocells marins de les Balears, 1991. *Anuari Ornitológic de les Balears*. Vol 6. G.O.B. Palma de Mallorca: 17-28.
- Amengual J.A. 1990. Llista Vermella dels Vertebrats de les Balears Vol. II. Documents tècnics de Conservació 2. Conselleria d'Agricultura i Pesca.
- Baha El Din M. and Baha El Din S., Egypt Bird Report (in publication)
- Beskaravajnyy M. M., Kostin S.Y. 2000. Wetlands of Kerch peninsula and south-eastern Crimea. Numbers and distribution of breeding waterbirds in the wetlands of Azov-Black Sea Region of Ukraine: P. 399-411.
- BirdLife International / European Bird census Council (2000) European birds populations: estimates and trends. Cambridge, UK: BirdLife International (BirdLife conservation Series No. 10)
- Blanco J.C., González J.L. 1992. Libro Rojo de los vertebrados de España. Iona. Madrid. 714 pp.
- Collar, N.J., Crosby, M.J., & Stattersfield, A.J. 1994. Birds to Watch 2. The World List of Threatened Birds. BirdLife International, Cambridge, UK.
- Crnkovic R. (1988). The discovery of an important Shag *Phalacrocorax aristotelis desmarestii* colony near Silba island (Croatia) in the Northern Adriatic. In: Les Amis des Oiseaux & Medmaravis. Ecologie des oiseaux marin et gestion intégré du littoral en Méditerranée.
- Dubois P.J., le Maréchal, G. Oliosio & P. Yésou (2000). Inventaire des Oiseaux de France.
- Eken, G., Karauz, S. & Kiraç, C.O. (in prep) The breeding population of Shag *Phalacrocorax aristotelis*, Audouin's Gull *Larus audouinii* and Yellow-legged Gull *Larus cachinnans* in Turkey. *Sandgrouse*.
- Gooman S. and Meininger P. The Birds of Egypt, Oxford University Press, 1989.
- Guyot, I. 1993. Breeding distribution and number of Shag (*Phalacrocorax aristotelis desmarestii*) in the Mediterranean. In Aguilar, J.S., Monabailiu, X., Paterson, A.M. Estatus y Conservación de Aves Marinas. Actas del II Simposio MEDMARAVIS. SEO. Madrid.
- Heredia B., Rose L. & Painter M. 1996. Globally threatened birds in Europe. Action plans. Council of Europe / BirdLife International, Strasbourg.
- Iapichino & Massa 1989. The Birds of Sicily. B.O.U. Checklist No. 11).
- Kiraç, C., Eken, G. & Karauz, S. (in prep) The Breeding Population of Some Marine Bird Species in Turkey.
- Lambertini M. & Leonzio C. 1986. Pollutant levels and their effects on Mediterranean seabirds. In MEDMARAVIS and Monabailiu, X. Mediterranean Marine Avifauna. : 359-378. Springer-Verlag. Berlin-Heidelberg.
- Meininger P.L., P.A. Wolf, D.A. Hadoud & M.F.A. Essghaier 1994. Ornithological survey of the coast of Libya, July 1993. WIWO Report 46. Zeist, The Netherlands.
- Moali A. & Isenmann P. (2000). Oiseaux d'Algérie - Birds of Algeria. SEO.
- Sultana, J. & C. Gauci. 1982. A New Guide to the Birds of Malta. The Ornithological Society, Malta.
- Tucker G.M. & Heath M.F. 1994. Birds in Europe: their conservation status. BirdLife International, Cambridge, UK.

## **Annex: Recommended conservation actions by country**

### **Albania**

- 1.2. Develop national coastal strategy
- 1.3. Ensure the enforcement and implementation of existing environmental laws
- 1.5. Promote the preparation of National Action Plans
- 1.6. Promote international co-operation and funding for research, monitoring and conservation
- 1.6.2. Ensure the full protection of Mediterranean Shag habitats with particular attention on nesting sites
- 2.1, 2.2. Prevent illegal fishing on IBAs and Protected areas
- 2.3. Prevent illegal tourism and illegal constructions
- 3.1. Set up an inventory of potential breeding sites
- 3.1. Set up and implement monitoring programme
- 4.1.3. Prepare and distribute educational materials

### **Bulgaria**

- 1.1. To harmonise the Bulgarian legislation (the new Biodiversity Conservation Act) with the existing EU Directives in order to influence policies in the Bulgarian part of the Black Sea to avoid accidental catch of endangered species, and to avoid coastal fish stock depletion.
- 1.3. To encourage the designation of the cliffs from Cape Kaliakra to Cape Shabla as the Bulgarian equivalent of SPAs (Bird Directive) and SACs (Habitat Directive) within the EMERALD and the National Ecological network.
- 1.3. To designate the coastline and the sea between the Cape Kaliakra and Cape Shabla as a Ramsar Site
- 1.4. To ensure regular and strict control of oil pollution at the area of occurrence of the species.
- 1.5. To promote preparation of a national action plan for the species.
- 2.1. To ensure adequate protection of the second colony as a strict reserve. It should include the relevant part of the steppe territory over the cliffs and the stretch of sea in front of it to serve as buffer zones from both land and sea. To include the whole cliff area between Cape Kaliakra and Cape Shabla in a nature park (IUCN V Category). Gill nets and fish traps to be not allowed in the sea portion used by the species in this area. Building and recreation development to be not allowed in the nearest to the cliffs areas of the coastline.
- 3.1. To determine current structure and numbers of the colonies and carry out breeding survey on the species.
- 3.2. To investigate the effect of the fishing activities on the species from the point of view of disturbance and mortality.
- 4.1. To produce information and awareness materials on the species and its sites and habitat preservation for various target groups.

### **Croatia**

- 1.3. Law enforcement
- 3.1. Monitor the population

### **Cyprus**

- 3.1. Monitor the entire population of the island

### **Egypt**

- 1.3. The species should be afforded legal protection.
- 2.1. Sallum and Ras El Hekma should be formally declared as protected areas and efforts taken to develop the management and infrastructure of the protectorates.
- 3.1. Surveys are required to determine the status of the species e.g. confirm breeding and the population size, identify habitats and identify and evaluate the threats.
- 4.1.2. National and local authorities need to be alerted about the conservation status of the species and encouraged to adopt the recommendations of the Action Plan.

## France

1.1. To influence policies in the Mediterranean to avoid accidental catch of endangered species, and to avoid coastal fish stock depletion at local level. At the EU level to enforce the implementation of existing Directives

1.3 Encourage the designation of all colonies as SPA (Birds Directive) and SACs (Habitats Directive) within the Natura 2000 network and ensure adequate protection of *Posidonia* prairies and buffer zones surrounding breeding areas and in the adjacent sea area.

1.5 To promote the preparation of national action plan

2.1 To ensure adequate protection of breeding sites, including to identification of buffer areas in land and in the sea in front of the colonies where the access of tourism should be regulated. Gill nets and fish traps should not be allowed close to the colonies and important roosting places. It is also necessary to prevent fishing activities negatively affecting food stocks and food availability for the species around IBAs or protected areas.

3.1 To determine current distribution and numbers and carry out breeding surveys on the species.

3.2 To Investigate the effect of fishing activities on Shag mortality and food availability.

4.1 To provide information and increase awareness on the need to preserve the Mediterranean Shag and its habitat, involving tourists, fishermen and any potential user of the areas in order to prevent disturbances.

## Gibraltar (UK)

1.1 To ensure proper enforcement of the Nature Protection Ordinance in respect to the ban on net fishing and sea bed raking.

1.4 Strict control of pollution.

1.7. Seeking of cross-border co-operation by fishermen and other authorities (the shags that nest in Gibraltar regularly feed in Spanish waters, including estuaries).

2. To prevent recreational disturbance by buoying-off of nesting sites in summer.

## Greece

1.3 Immediately classify as SPAs the following IBAs which classify for the Mediterranean Shag: Samothraki island, West and North Zakynthos, Psara and Antipsara Islands, Gavdos and Gavdopoula Islands, extend the boundaries of the following IBAs: Delta Nestou and coastal lagoons, Kithira island, and Islets of north Dodekanisa in order to include the colonies of the species. Promote the designation of all colonies as SPA (Birds Directive) and ensure adequate protection of *Posidonia* prairies and buffer zones surrounding breeding areas and in the adjacent sea area.

1.4 Prevent oil spills and chemical pollution of the sea.

1.5 To promote the preparation of national action plans

2.1 To ensure adequate protection of breeding sites, including establishment of buffer areas on land and at the sea in front of the colonies where the access of tourism should be regulated. Gill nets and fish traps should not be allowed close to the colonies and important roosting places. It is also necessary to regulate fishing activities negatively affecting food stocks and food availability for the species around IBAs or protected areas. Special attention should be taken in patrolling along the coast in order to prevent illegal fishing with dynamites.

3.1 To locate the main breeding colonies and determine current distribution and numbers, and carry out breeding surveys on the species. 3.2 To carry out research to assess the effect of fishing activities on Shag mortality and food availability.

4.1 To provide information and increase awareness on the need to preserve the Mediterranean Shag and its habitat, involving tourists, fishermen and any potential user of the areas in order to prevent disturbances.

4.1.5. To use the species together with other priority species (*Larus audouinii*, *Falco eleonora*) for the promotion of the importance of uninhabited islets and rocky coasts as precious nature areas in the Aegean region.

## Italy

1.1. To influence policies in the Mediterranean to avoid accidental catch of endangered species, and to avoid coastal fish stock depletion at local level. At the EU level to enforce the implementation of existing Directives



1.3 Encourage the designation of all colonies as SPA (Birds Directive) and SACs (Habitats Directive) within the Natura 2000 network and ensure adequate protection of *Posidonia* prairies and buffer zones surrounding breeding areas and in the adjacent sea area.

1.4 Prevent oil spills and chemical pollution of the sea. Ban oil tanker in sensitive marine ecosystems as Bonifacio Straits.

1.5 To promote the preparation of national action plans

2.1 To ensure adequate protection of breeding sites, including to identification of buffer areas in land and in the sea in front of the colonies where the access of tourists should be regulated. Gill nets and fish traps should not be allowed close to the colonies and important roosting sites. It is also necessary to prevent fishing activities negatively affecting food stocks and food availability for the species around IBAs or protected areas.

3.1 To determine current distribution and numbers and carry out breeding surveys on the species.

4.1 To provide information and increase awareness on the need to preserve the Mediterranean Shag and its habitat, involving tourists, fishermen and any potential user of the areas in order to prevent disturbances.

## **Spain**

1.1. To influence policies in the Mediterranean to avoid accidental catch of endangered species, and to avoid coastal fish stock depletion at local level. At the EU level to enforce the implementation of existing Directives

1.3 Encourage the designation of all colonies as SPA (Birds Directive) and SACs (Habitats Directive) within the Natura 2000 network and ensure adequate protection of *Posidonia* prairies and buffer zones surrounding breeding areas and in the adjacent sea area.

1.4 Prevent oil spills and chemical pollution of the sea.

1.5 To promote the preparation of national action plan

2.1 To ensure adequate protection of breeding sites, including the identification of buffer areas on land and at sea in front of the colonies where the access of tourists should be regulated. Gill nets and fish traps should not be allowed close to the colonies and important roosting places. It is also necessary to prevent fishing activities negatively affecting food stocks and food availability for the species around IBAs or protected areas, specially in Cap Blanc (Mallorca) and Cabrera National Park

3.1 To determine current distribution and numbers and carry out breeding surveys on the species.

4.1 To provide information and increase awareness on the need to preserve the Mediterranean Shag and its habitat, involving tourists, fishermen and any potential user of the areas in order to prevent disturbance.

## **Tunisia**

1.2 To develop national coastal strategies.

1.5 To promote the preparation of National Action Plans.

2.2 To reduce mortality of adults and offsprings.

2.2.1. To reduce mortality around colonies and roosting sites from fishing nets.

2.2.2 Introduced predators as rats, feral cats and Genets should be eradicated in the colonies.

3.1. To set up and implement a monitoring programme.

3.2 To undertake research on ecology.

3.2.1 Population dynamics.

3.2.2. Feeding ecology and habitat use.

3.2.3. Seasonal movements.

3.2.4 Limiting factors.

4.1 To provide information and increase awareness.

4.1.1 Involve tourists, fishermen and any potential user of the areas in preventing disturbances.

4.1.3 Prepare and distribute educational material.

4.1.5 Promote awareness for the value of uninhabited islets and rocky coasts.

## **Turkey**

1.2. To promote national strategies on protection of coastal habitats in Turkey and integrate to development plans in coastal areas.

1.4 To prevent oil spills and chemical pollution into the sea.

- 2.1 To declare all breeding sites as protected areas
  - 2.1.1 To prevent human activities especially breeding season around the colony sites.
  - 2.1.1 To prepare a management plan for Ildir Bay Islands IBA where the species breeds on the ground and extremely fragile to disturbance
- 3.1 To carry out a survey in the Marmara Sea, Northern Aegean and in the Western Mediterranean to identify new breeding sites
- 3.1 To set up and implement a monitoring programme
- 3.2.2 To carry out research on feeding ecology of the species.
- 3.3 To ensure the exchange of information is guaranteed between institutions and researchers.
- 4.1 To increase public awareness on protection of coastal habitats and the marine species in Turkey.

### **Ukraine**

- 1.1. To influence policies in the Mediterranean in order to avoid accidental catch of endangered species and coastal fish stock depletion.
- 1.3.3. Encourage the establishment of buffer zones surrounding breeding areas including the adjacent sea area.
- 1.4. Prevent oil spills and chemical pollution of the sea
- 2.3.1. Prevent habitat alteration at the feeding areas
- 3.1. To set up and implement a monitoring programme
- 3.2. To undertake research on ecology, population dynamics and limiting factors