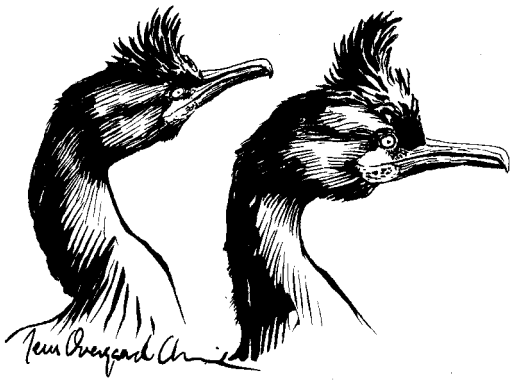
Species Action Plan
for the
Mediterranean Shag *Phalacrocorax aristotelis desmarestii*
in Europe



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Species Action Plan for the Mediterranean Shag *Phalacrocorax aristotelis desmarestii* in Europe

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Timetable
First version: July 1999
Workshop: 3-5 September 1999
Final version: December 1999

Reviews
This Action Plan should be reviewed and updated every 4 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 Purple Gallinule: Spain, Italy, Greece, France and Gibraltar (UK).

Contents

Summary

Phalacrocorax aristotelis desmarestii is the subspecies endemic of the Mediterranean. Its biology and population figures are not well studied. The species breeding range includes all EU Member States along the mediterranean coast and Gibraltar. 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, localy high

Overfishing - Unknown, localy 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

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 basin. 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.

This Action Plan relies largely on the results of a Workshop on the subspecies held in the Balearic Islands, on September 1999. 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 basin. The total population was estimated to be less than 10.000 pairs, half of them breeding in the EU (Eastern coast of Spain, Baleares, 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

Country	**N. of pairs**	**N. of colonies**
Albania	20	?
Algeria	40	5
Bulgaria	30	1
Cyprus	50	8
France	1.000	25
Former Yugoslavia	1.500-2.000	>30
Gibraltar	5-8	1
Greece	<1000 ?	>55
Italy	2000	>30
Lybia	50	?
Morocco	0?	?
Spain	1.250	>30
Tunisia	50	3
Turkey	?	>2
Ukraine	800	5
Total	**<10.000**	**> 195**

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.

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
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

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

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

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

1) To avoid accidental catch of endangered species;
2) Locally avoid coastal fish stock depletion.

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

Priority: high
Time-scale: 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
Time-scale: 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 Mediterraneean 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
Time-scale: 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 incluiding 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
Time-scale: 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 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

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

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Annex - Recommended conservation actions by country

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 eleonorae*) 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.