

The Regional Organization for the  
Conservation of the Environment of  
the Red Sea and Gulf of Aden  
(PERSGA)

*Regional Action Plan for the  
Conservation of Breeding Seabirds  
and their Habitats in the Red Sea and  
Gulf of Aden*

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PERSGA is an intergovernmental organisation dedicated to the conservation of coastal and marine environments and the wise use of the natural resources in the Red Sea and Gulf of Aden region.

The Regional Convention for the Conservation of the Red Sea and Gulf of Aden Environment (Jeddah Convention) 1982 provides the legal foundation for PERSGA. The Secretariat of the Organization was formally established in Jeddah following the Cairo Declaration of September 1995. The PERSGA member states are Djibouti, Egypt, Jordan, Saudi Arabia, Somalia, Sudan, and Yemen.

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## PREFACE

The Red Sea and Gulf of Aden region is recognised as an important area for seabirds, with 17 species breeding regularly. One species and two sub-species are endemic to the region. A further group of taxa, at both specific and sub-specific levels, is endemic to the northwest Indian Ocean and important sub-populations breed in the region. One species is Globally Threatened and three are considered to be Near Threatened.

During the last decade there has been an upsurge in seabird research and knowledge. There are several reasons for such progress. Increased exploitation of natural resources has led to a greater awareness of potential conflicts with seabirds, and pollution research has shown that seabirds are useful as an indicator of the health of our environment. The Red Sea and Gulf of Aden contain several internationally significant areas for breeding seabirds. Some species in the region have suffered serious declines in numbers and require conservation actions to be taken to reduce the threats they are facing.

PERSGA has taken several steps towards the conservation of these key species. Initially a set of regionally applicable Standard Survey Methods (SSM) for Breeding Seabirds was developed. The second step involved training regional specialists in these methods. Surveys were then conducted to determine the status of breeding seabirds within the region. The fourth step was the preparation of this Regional Action Plan (RAP) for the Conservation of Breeding Seabirds in the Red Sea and Gulf of Aden.

Immediate adoption and implementation of the Seabird RAP will lead to a reduction in threats to seabirds and to their breeding areas. An attempt has been made to predict and quantify the impacts of these threats to seabird populations over the next twenty years. Particular attention is given to identifying actions that can be taken to alleviate the threats that are considered to be most severe. The RAP identifies and prioritises a set of actions related to the key seabird conservation components.

Prof. Dr. Abdelelah A. Banajah  
Secretary General of PERSGA

## **LIST OF ABBREVIATIONS AND ACRONYMS**

ALECSO	Arab League Educational, Cultural and Scientific Organization
CBD	Convention on Biological Diversity
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
EEAA	Egyptian Environmental Affairs Agency
EIA	Environmental Impact Assessment
GEF	Global Environment Facility
IBA	Important Bird Area
ICZM	Integrated Coastal Zone Management
IUCN	The World Conservation Union
MARPOL	International Convention for the Prevention of Pollution from Ships
MPA	Marine Protected Area
NCWCD	National Commission for Wildlife Conservation and Development
PERSGA	Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden
RAP	Regional Action Plan
ROPME	Regional Organization for the Protection of the Marine Environment
RSGA	Red Sea and Gulf of Aden
SAP	Strategic Action Programme
UNCLOS	United Nations Convention on the Law of the Sea
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNEP-ROWA	UNEP - Regional Office for Western Asia
WHC	World Heritage Convention
WWF	World Wide Fund for Nature

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This Regional Action Plan (RAP) for the Conservation of Seabirds in the Red Sea and Gulf of Aden was initiated following national surveys of the status of breeding seabirds arranged by PERSGA and builds on information collected over many years by dedicated ornithologists throughout the region. The RAP was prepared by Dr. Nigel Varty, Dr. Omar Al-Saghier and Dr. Graham Tucker, independent ecological consultants under contract to BirdLife International, with project management from PERSGA. Valuable comments and information were also supplied by participants at a PERSGA workshop on the Seabird RAP, held in Jeddah from 27<sup>th</sup>-28<sup>th</sup> September 2003. Participants included: Abdoukader Ahmed Aouled (Djibouti), Khaled Said Nassar (Jordan), Abdul Latif Ibrahim Abdo (Egypt), Mohammed Y. Shobrak and Mohammed Ibrahim Al-Salamah (Saudi Arabia), Mahmoud Saied Mahmoud (NE Somalia), Mohamed Egal Kileh (NW Somalia), Maeen Lutf Al-Sewari (Yemen), Dr. Saiyed Al-Khouli, Dr. Mahmoud K. El-Sayed and Mr. Mohammed Y. Abdul Salam (PERSGA). We acknowledge the commitment and dedication of the late Secretary General of PERSGA, Dr. Nizar I. Tawfiq for his leadership and inspiration. Financial support for the preparation of this document was made available through the Strategic Action Programme for the Red Sea and Gulf of Aden (SAP) executed by PERSGA and implemented by the GEF partners, UNDP, UNEP and the World Bank, with supplementary funding from the Islamic Development Bank and the countries of the Region. Valued assistance in the preparation of the Plan was provided by the BirdLife International and representatives of all the participating countries.

## 1. EXECUTIVE SUMMARY

This Plan provides a set of priority actions for the conservation and sustainable development of seabirds and associated habitats in the Red Sea and Gulf of Aden (RSGA). The Region<sup>1</sup> is recognised as being important for its seabirds, with 17 species of true seabirds breeding regularly. One species and two sub-species are endemic to the Region. A further group of taxa, at both specific and sub-specific levels, is endemic to the northwest of the Indian Ocean area and important sub-populations breed in the RSGA Region. Of the seabirds in the Region, one species is Globally Threatened and three are considered to be Near Threatened. However, the population status of most species is poorly known.

The RSGA has a wide range of suitable habitats for breeding seabirds, but there are many well documented threats to seabirds and their habitats within the Region. Of these, the principal threats are considered to be from:

- Human disturbance of nest sites
- Human exploitation of seabirds
- Habitat destruction and degradation
- Pollution, both terrestrial and marine
- Impacts of fishing and associated activities
- Introduced and invasive species

In most cases the threats occur across the Region but vary in intensity between and within countries. An attempt has therefore been made to predict and quantify the impacts of these threats to seabird populations in the RSGA over the next twenty years. Particular attention is then given to identifying actions that can be taken to alleviate those threats that are considered to be most severe.

The RAP identifies and prioritises a set of actions related to the following seven key seabird conservation components:

- Integrated Coastal Zone Management (ICZM) Planning for Seabirds
- Education, public awareness and community participation
- Site and habitat protection and management
- Regulation of human exploitation
- Research and monitoring
- Legislation
- Institutional capacity building and training

The actions identified in the plan have been prioritised into three levels, based on their potential impacts on the prioritised threats to seabirds. It is suggested that a Steering Committee should be established to coordinate the implementation of all of the RAPs. The Steering Committee should include representatives from each participating nation and other major regional and national organisations. These will act as the interface between government, major donor agencies and international mangrove initiatives, and will identify national responsibilities and priorities for actions in relation to the needs of all the RAPs and available funding.

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<sup>1</sup> The Region (capital 'R') denotes the geographical coverage of the Red Sea and Gulf of Aden region as defined in Article II of the Regional Convention for the Conservation of the Red Sea and Gulf of Aden Environment, 1982.

## 2. INTRODUCTION

### 2.1 The Red Sea and Gulf of Aden Region

The Red Sea and Gulf of Aden (RSGA) region, herein referred to as the Region, is a complex and unique tropical marine ecosystem, with extraordinary biological diversity and a remarkably high degree of endemism.

The Red Sea is one of the most important repositories of marine biodiversity on a global scale and supports a particularly high diversity of corals (PILCHER 2003). It lies within a deep trench (depths exceeding 2,000 m) formed by the northerly extension of the African rift valley system, is 1,932 km long and has a surface area of approximately 435,000 km<sup>2</sup>.

The Gulf of Aden (1,400 km long) is one of the least well known areas of the Indian Ocean in terms of its biology. It holds fishery resources of international importance due to the upwelling of cool, nutrient-rich water during the southwest and northeast monsoons and is characterised by a prevailing high-energy climate. Rocky cliffs, alternating with long stretches of littoral and sub-littoral sand along coastal plains, dominate Yemen's coastline. Little is known about the coastal and marine resources of the Gulf of Aden off Somalia.

The Socotra Island Group, consisting of Socotra Island and three outlying islands (Abd al-Kuri, Samha and Darsa, with the two rocky outcrops of Sabonyiah and Ka'l Farun), is situated at the eastern extreme of the Gulf of Aden, some 400 km south of the Arabian Peninsula. It contains unique aquatic and terrestrial ecosystems and species, with limited impacts from human activities. The World Wide Fund for Nature (WWF) has described the archipelago as an "Indian Ocean version of the Galapagos" based on the high degree of endemism and unique vegetation types on the islands and it is thought to be an extremely important area for marine biogeography (PERSGA/GEF 1998).

### 2.2 Breeding seabirds of the RSGA Region

Although the fauna of the RSGA have been relatively poorly studied, the Region is recognised as important for its seabirds, with 17 species of true seabirds breeding regularly. Several endemic taxa occur, including the White-eyed Gull (*Larus leucophthalmus*) and subspecies of the Red-billed Tropicbird (*Phaeton aethereus indicus*) and Brown Noddy (*Anous stolidus plumbeigularis*). A further group of taxa, at both specific and sub-specific levels, is endemic to the northwest of the Indian Ocean area and important sub-populations of many breed in the RSGA Region, including Jouanin's Petrel (*Bulweria fallax*), Sooty Gull (*Larus hemprichii*), Swift Tern (*Sterna bergii velox*), White-cheeked Tern (*Sterna repressa*) and Socotra Cormorant (*Phalacrocorax nigrogularis*). Many of these populations face human threats and therefore need conservation.

### 3. DEVELOPMENT AND SCOPE OF THE REGIONAL ACTION PLAN

#### 3.1 Background to the Regional Action Plan

PERSGA, the “Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden”, is an intergovernmental body responsible for the development and implementation of regional programmes for the protection and conservation of the marine environment of the RSGA. The PERSGA member states are: Djibouti, Egypt, Jordan, Saudi Arabia, Somalia, Sudan and Yemen.



**Figure 1. Map of the Red Sea and Gulf of Aden**

PERSGA's Strategic Action Programme (SAP), funded through the Global Environmental Facility (GEF) implementing agencies (United Nations Development Programme, United Nations Environment Programme and the World Bank), the Islamic Development Bank and the PERSGA member states, aims to protect biodiversity and the wider environment of the RSGA. It was formally launched in 1998 and comprises eight Components, one of which is “Habitat and Biodiversity Conservation” (Component 4). One of the main activities under Component 4 is the

preparation of Regional Action Plans (RAPs) for the conservation of key taxa and habitats, such as coral reefs, mangroves, seabirds and sea turtles.

Prior to the development of the RAP for breeding seabirds, PERSGA initiated a programme to collect, collate and update information on the Region's seabirds. This involved:

- Development of Standard Survey Methods (SSM) for surveying the Region's breeding seabirds
- Training of national seabird specialists in the use of the SSM
- Field surveys to assess population sizes and collect additional information on habitats and threats and
- Preparation of National Reports presenting the current status of seabirds in PERSGA countries.

Field surveys were carried out in Djibouti, Sudan and Yemen, including the Socotra Island Group (AL-SAGHIER et al. 1999; AL-SAGHIER 2002b; SHOBRAK et al. 2002a, 2002b). In addition, regional experts compiled national reports to document the status of seabirds in three PERSGA countries that were not surveyed: Egypt, Saudi Arabia and Somalia (SHOBRAK 2002; SHOBRAK et al. 2002c; BAHA EL DIN et al. 2003). Jordan was not surveyed as there are no islands within the Jordanian Red Sea territory and there are no documented records of seabirds currently breeding in the country. From these reports and other relevant literature, a report titled *Status of Breeding Seabirds in the Red Sea and Gulf of Aden* was produced (PERSGA/GEF 2003a). The background information in this RAP is largely drawn from these regional and national reports.

### **3.2 Scope of the Regional Action Plan**

This RAP presents a summary of the current knowledge of the status of the breeding seabirds of the RSGA Region, a review of the threats facing these species and their key breeding sites, and information on current national and international legislation influencing seabirds and their habitats. This information is used to assign conservation priorities for each seabird species and to quantify the significance of the threats to them. Building on this the RAP then presents a prioritised Framework for Action that consists of seven components:

1. Integrated coastal zone management planning for seabirds
2. Education, public awareness and community participation
3. Site and habitat protection, and management
4. Regulation of human exploitation
5. Research and monitoring
6. Legislation
7. Institutional capacity building and training

For each of the components, regional priority actions are identified by relating the actions to their potential impacts on the prioritised 'threats to species'. Finally, an outline strategy for implementing the actions, in relation to other RAPs and national priorities, is proposed.

## **4. STATUS OF BREEDING SEABIRDS IN THE RED SEA AND GULF OF ADEN**

### **4.1 Status of species**

Seventeen species of true seabirds have been recorded breeding in the Red Sea and Gulf of Aden. True seabirds are those that are dependent on the sea for the majority of their food and usually breed on islands or along coasts. These include petrels, tropicbirds, boobies, cormorants, gulls and terns. Other species in the Region, notably pelicans, herons, egrets, osprey (*Pandion haliaetus*), Crab Plover (*Dromas ardeola*) and Kentish Plover (*Charadrius alexandrinus*), also use the coastal marine environment but are not restricted to it. Only true seabirds are covered here.

The most common of the 17 species is the Bridled Tern (*Sterna anaethetus fuligula*) with an estimated population of 240,000 pairs (Table 1). The rarest, in terms of numbers breeding in the RSGA Region, is the Little Tern (*Sterna albifrons*), which is believed to nest (still to be confirmed) in very small numbers in the northern Egyptian Red Sea, but is on the very edge of its Palearctic range.

Estimates of the number of breeding seabirds in each of the PERSGA countries are given in Annex 1.

### **4.2 Ecology of breeding seabirds in the RSGA Region**

Most of the breeding seabirds in the RSGA Region, particularly the terns, feed largely on small fish and invertebrates such as squid and shrimp in shallow water coastal habitats, such as lagoons and around islands. The exceptions are Jouanin's Petrel (about which little is known), Persian Shearwater (*Puffinus persicus*), Masked Booby (*Sula dactylatra*), Socotra Cormorant, Sooty Gull, Sooty Tern (*Sterna fuscata*) and Brown Noddy. However, these species probably feed mostly in coastal waters during the breeding season.

All 17 species usually nest in colonies, some in association with other species. For many species, notably the terns and gulls, nests are located on sandy or coral offshore islands or beaches.

Annex 2 gives a summary of the main feeding and nesting habits of the 17 seabird species breeding in the Red Sea and Gulf of Aden. More details can be found in PERSGA/GEF (2003a) and the various national seabird status reports (AL-SAGHIER et al. 1999; AL-SAGHIER 2002b; BAHA EL-DIN et al. 2002; SHOBRAK et al. 2002a, 2002b, 2002c).

### **4.3 Priority bird species**

Of the true seabirds that occur in the Region, only the Socotra Cormorant is recognised as Globally Threatened by BirdLife International (on behalf of IUCN), and is classified as Vulnerable (Table 2). However, three other species are considered to be Near Threatened: Jouanin's Petrel, Persian Shearwater and White-eyed Gull. Some species are also listed under the Convention on Migratory Species (see Annex 3).

Table 2 gives a 'priority' coding for each species based on their national and international threat status and their distributions. Species that are both internationally threatened and have a restricted range (top right-hand corner), such as White-eyed Gull, rank higher and are in greater need of conservation action than species that are common and widespread (bottom left-hand corner), such as Brown Booby or Bridled Tern.

**Table 1. Distribution and population of breeding seabirds in the RSGA**

Species	Distribution of species or subspecies	RSGA population estimate (pairs)	Reference PERSGA/GEF 2003a and others as given
Jouanin's Petrel <i>Bulweria fallax</i>	Endemic to northwest Indian Ocean	3,000 **	AL-SAGHIER et al. (unpublished)
Persian Shearwater <i>Puffinus persicus</i>	Endemic to the Indian Ocean and Gulf of Aden	10,000 **	
Red-billed Tropicbird <i>Phaethon aethereus indicus</i>	Subspecies endemic to RSGA and Arabian Sea to Arabian Gulf	700	
Brown Booby <i>Sula leucogaster plotus</i>	Subspecies occurs throughout Indo-Pacific	15,000*	
Masked Booby <i>Sula dactylatra melanops</i>	Subspecies endemic to western Indian Ocean	1,000	
Socotra Cormorant <i>Phalacrocorax nigrogularis</i>	Endemic to Arabian Sea and Gulf of Aden	15,000***	JENNINGS 2003 and AL-SAGHIER 2002a
Sooty Gull <i>Larus hemprichii</i>	North-west Indian Ocean	4,000	
White-eyed Gull <i>Larus leucophthalmus</i>	Endemic to RSGA Region	11,000*	
Caspian Tern <i>Sterna caspia</i>	Widespread beyond Region	500*	
Swift Tern <i>Sterna bergii velox</i>	Subspecies endemic to RSGA Region	3,500*	
Lesser Crested Tern <i>Sterna bengalensis</i>	North African coast, Arabian Sea, Indo-Pacific	14,000	
White-cheeked Tern <i>Sterna repressa</i>	RSGA Region, Arabian Sea, northwest Indian ocean	27,000*	
Sooty Tern <i>Sterna fuscata</i>	Tropical and subtropical zones of Pacific, Indian and Atlantic oceans	7,000	DELANY & SCOTT 2002
Bridled Tern <i>Sterna anaethetus fuligula</i>	RSGA, Arabian Gulf, Arabian Sea, Indo-Pacific and locally West Africa	240,000*	
Little Tern <i>Sterna albifrons albifrons</i>	Widespread, west Palearctic, India, Pacific, West Africa, North America and Caribbean	-	-
Saunders's Little Tern <i>Sterna saundersi</i>	RSGA, northwest Indian Ocean and east African and north-west Indian coasts	200*	DELANY & SCOTT 2002
Brown Noddy <i>Anous stolidus</i>	Widespread in tropical and subtropical zones in Atlantic, Indian and Pacific Oceans	26,000*	

\* = Count of breeding birds from surveyed coasts and islands; \*\* = Estimated breeding population on Socotra Island Group; \*\*\* = Estimated breeding population on islands off Bir Ali and Socotra

**Table 2. Conservation priorities for seabirds in the RSGA Region based on their global and regional conservation status and the biogeographical importance of their RSGA populations**

	Wide distribution	Near endemic species or endemic sub-species	Endemic species to RSGA Region
<b>Globally Threatened<sup>1</sup></b>	PRIORITY B	PRIORITY A Socotra Comorant	PRIORITY A
<b>Regionally Threatened<sup>2</sup> or globally “Near Threatened”<sup>1</sup></b>	PRIORITY C	PRIORITY B Jouanin’s Petrel Persian Shearwater Masked Booby	PRIORITY A White-eyed Gull
<b>Insufficiently Known</b>	PRIORITY C	PRIORITY B Swift Tern	PRIORITY A
<b>Non-threatened</b>	PRIORITY D Brown Booby Caspian Tern Lesser Crested Tern White-cheeked Tern Sooty Tern Bridled Tern Saunders’s Little Tern Little Tern * Brown Noddy	PRIORITY C Sooty Gull Red-billed Tropicbird	PRIORITY B

**Sources:** <sup>1</sup> BIRDLIFE INTERNATIONAL (2000) *Threatened Birds of the World*. & BIRDLIFE INTERNATIONAL 2003 *BirdLife’s Online World Bird Database: the site for bird conservation*. Version 2.0. Cambridge, UK: BirdLife International. Available: <http://www.birdlife.org> (accessed 29/9/2003). ‘Globally Threatened’ is given according to the IUCN status of the species.

<sup>2</sup> ‘Regionally Threatened’ species were identified at the PERSGA Seabird RAP workshop taking into account information provided in this RAP and the Regional Status Report (PERSGA/GEF 2003a). ‘Insufficiently known’ signifies that there is not enough data to be able to determine the threat status for the species, but it is assumed to be regionally or nationally threatened.

\* - Red Sea is on the very edge of its range.

#### **4.4 Key sites for breeding seabirds – Important Bird Areas**

The regional report on the status of breeding seabirds in the RSGA (PERSGA/GEF 2003a) lists 31 Important Bird Areas (IBAs), identified through consultation with seabird experts at national and regional levels, that are particularly important for (true) breeding seabirds in the Region (Annex 4). IBAs are sites of high importance for their avifauna and are selected using internationally accepted criteria developed by BirdLife International’s Important Bird Areas Programme (see EVANS 1994 and FISHPOOL & EVANS 2001). The sites listed in Annex 4 should be considered priority targets for protection. Unfortunately, only 11 of the 31 IBAs (35%) are currently fully protected.

Further information on the most important IBAs for breeding seabirds in the Red Sea and Gulf of Aden Region is given in PERSGA/GEF (2003a). Additional IBAs have been identified during recent seabird surveys in Yemen.

## **5. THREATS FACING BREEDING SEABIRDS IN THE RSGA REGION**

The Red Sea and Gulf of Aden, their coastal areas and islands, offer ideal habitats for breeding seabirds. However, as noted by several authors there are many threats to the marine environment in the RSGA (UNEP/PERSGA 1997) and to seabirds (e.g. GALLAGHER et al. 1984; EVANS 1987). The national and regional seabird status reports for the RSGA Region also identified threats to species and sites. These sources suggest that the principal threats are from:

- Human disturbance of nest sites
- Human exploitation of seabirds
- Habitat destruction and degradation
- Pollution, both terrestrial and marine
- Impacts of fishing and associated activities
- Introduced and invasive species.

In most cases, the threats occur across the Region but vary in intensity between and within countries. Impacts on individual species also vary according to their distribution, their use of habitats and their ecological requirements. The threats to seabirds in the Region are therefore described in more detail below, and this is followed by an assessment of impacts on individual species.

### **5.1 Human disturbance at nest sites**

Most of the seabird species of the RSGA Region breed in colonies and are therefore susceptible to disturbance. Furthermore, because many species are concentrated in relatively few colonies, harmful activities at one site may have a major impact on national or even regional populations. Disturbance affects birds and colonies in a number of ways. Disturbed incubating birds can leave their nest exposed to predators and heat, and ‘stampeding’ birds can crush eggs. Chicks of small species like terns are very susceptible to heat-stress and can die from heat-stroke and dehydration if they are not protected by their parents. Once the chicks are able to move independently, disturbance may cause them to break cover and range out of their natal territory, making them vulnerable to predation and harassment from other birds. Excess disturbance in other parts of the world have been shown to result in adults abandoning nests, shifts in colony location, interruption of feeding patterns, and delayed breeding (e.g. TUCKER & EVANS 1997; GREAT BARRIER REEF MARINE PARK AUTHORITY 1997).

Human disturbance is, of course, most intense in coastal areas and islands close to urban and tourist centres but takes a number of forms.

#### ***Tourists and recreational users***

Disturbance and damage to nesting and feeding habitats of breeding seabirds by tourists and recreational users is a major and now permanent problem in some areas of the Region, particularly in the northern Red Sea (GRIEVE AND MILLINGTON 1999; BAHA EL-DIN 2001). Numbers of weekend and casual urban visitors to once isolated beaches, islands and reefs have increased as old urban centres have expanded or new ones have been established along the coasts, with access to offshore islands made easier by the availability of high-powered boats.

In some countries, such as Saudi Arabia, access to islands is forbidden and controlled by the coastguard in order to reduce human pressure on sites important for biodiversity. However, disturbance by tourists and recreational users (and fishermen) still occurs (SHOBRAK 2001). Even relatively brief visits to breeding seabird colonies by wildlife-aware tourists, with no deliberate interference, can cause significant disturbance to nesting birds and result in lowered reproductive success (GREAT BARRIER REEF MARINE PARK AUTHORITY 1997).

### ***Other causes of disturbance***

On some Red Sea islands fishermen have established semi-permanent dwellings or erected summer camps leading to disturbance of nesting seabirds. Sheep and goats are also kept on some islands and these have been known to disturb breeding seabirds and trample nests and eggs (SHOBRAK 2002b).

## **5.2 Human exploitation of seabirds**

### ***Egg collecting***

Collection of seabird eggs for human consumption is a traditional activity among fishermen in the RSGA Region (SHOBRAK et al. 2002). In the past, seabirds' eggs formed an important addition to the diets of fishermen and coastal populations (GALLAGHER et al. 1984), and this is still the case today, particularly in areas with low fish stocks or among poorer communities. Soldiers stationed on islands with seabird colonies also take eggs to supplement their diet. Today, any known offshore breeding site is easily accessible with the availability of powerful motors fitted to even small boats in most countries in the Region.

Egg collecting is not uniform across the Region. In Saudi Arabia, evidence indicates a decline in egg collecting among fishermen and local people, whilst in Egypt the situation is not clear (BAHA EL-DIN 2003). The activity still occurs in Sudan, is reported to be common in Djibouti and is considered severe in Somalia, where the economic situation has probably led to an increase in the activity in recent years (WELCH AND WELCH 1998; SHOBRAK 2002; SHOBRAK et al. 2002a, 2002b). In Yemen, egg collecting is still practiced and could be significant on the mainland but in the Socotra Island Group, where eggs and chicks were an important food during the monsoon season, it has been largely abandoned due to improved availability of imported foods and the difficulty and risk of collecting from cliffs and islets (TALEB 2002; JENNINGS 2003).

The impact of egg collecting has not been well documented in the Region but it is clear that the combined impacts of fishermen and soldiers may significantly affect the distribution and overall breeding success of seabirds. The numbers of eggs collected may be significant even where small numbers of collectors are involved.

In Yemen, fishermen have been observed eating Socotra Cormorant and Persian Shearwater chicks (TALEB 2002).

### ***Hunting and trapping***

None of the national seabird reports indicated serious hunting of adult seabirds in RSGA countries for food or for sport. This is probably because of the wide availability of cheap poultry and the generally poor taste of seabird meat. However, shooting/trapping of terrestrial birds such as warblers, orioles, shrikes, wheatears and robins for food in coastal areas and on islands of southern Saudi Arabia and Yemen is a common practice during their spring migration, and there

is always a risk that some seabirds may be caught accidentally in nets or 'limed' vegetation at the same time.

### **5.3 Introduced predators and invasive species**

The introduction of alien species into new environments, especially onto islands, has probably had the single biggest impact on seabird populations on a global scale (MOORS & ATKINSON 1984; ATKINSON 1985; PRIMACK 1993; BURGER & GOCHFELD 1994). A variety of predators, chiefly mammals, deliberately or accidentally brought to the islands of the RSGA, threaten nesting seabirds, especially ground nesting species. They may prey on eggs, chicks and, if possible, adult birds. Several other species that have spread into the Region due to land use changes and possibly climate change also pose a direct threat. The impacts of mammalian predators may not be serious in population terms if there is a surplus of suitable mammal predator-free islands for nesting. However, it is not known if this is the case for any seabirds in the Region. Furthermore, expansion of predators may eventually deplete such sites so that, even if predation does not limit seabird populations now, it may do so in the future, potentially leading to a rapid and catastrophic population crash.

#### ***Introduced mammals***

Introduced mammalian predators were reported to cause severe impacts on breeding seabirds in all RSGA countries (PERSGA/GEF 2003a). Fishermen or coastguards deliberately brought cats and dogs to offshore islands, whereas rats and mice were probably introduced accidentally.

A severe infestation of rats was reported on Darsa Island in the Socotra Island Group resulting in heavy mortality among Sooty Gull chicks and the abandonment of the breeding colony. High populations of island rats have led to the introduction of cats on some Red Sea islands when military bases have been established (NEWTON & AL SUHAIBANI 1996; PERSGA/GEF 2003a). In Sudan, rats appear to be the main mammalian predator in the coastal areas and islands.

The White-tailed Mongoose (*Ichneumia albicauda*) is probably the principal reason ground nesting seabirds do not occur on certain islands in the Red Sea and it has been shown to have a severe adverse effect on the breeding success of the Osprey in the Farasan Islands (FISHER 2001). Similarly, the introduction of the Lesser Indian Civet Cat (*Viverricula indica*) to Socotra along with feral cats resulted in the disappearance of ground nesting seabird species, apart from a small number of Saunders Little Tern (AL-SAGHIER 2000).

#### ***Invasive species***

The spread of the Indian House Crow (*Corvus splendens*) to all major cities and many small villages along the RSGA coast, and recently to offshore islands such as the Socotra Island Group, poses a major threat to breeding seabirds and is a cause of deep concern among the local conservation community (AL-SAGHIER et al. 1999; SHOBRAK et al. 2002a, 2002b). In the last ten years the range and population of this species has expanded dramatically to cover all coastal habitats along the Red Sea and parts of the Gulf of Aden (in the Red Sea it is believed to have first arrived at Port Sudan).

The species will prey on other birds' eggs and chicks, is a strong competitor for food, is highly adaptable, a strong flier and breeds quickly. In 1996 a pair was transported by ship to Socotra and within three years there were 26. Trapping and shooting have proven relatively unsuccessful. An attempt at control in the Yemeni city of Aden in the mid 1980s killed 250,000

birds but the population recovered within a few years. Destroying chicks while in the nest may offer a more effective population control technique. Along with mainland seabird nesting sites, islands close offshore are the most vulnerable and have been targets of Indian House Crow predation (SHOBRAK 2002; AL-SAGHIER 2002a).

As yet there is no evidence that breeding seabirds on Socotra have been affected (although terrestrial species have been predated) and a control campaign has had some success (AL-SAGHIER 2000). However, if the species does become well established, breeding colonies of Brown Booby (*Sula leucogaster*), Masked Booby and Socotra Cormorant could suffer heavy losses.

#### **5.4 Habitat destruction and degradation**

The Region's seabirds are threatened by a direct destruction of nesting and feeding sites, particularly by uncontrolled development, and indirectly through a gradual degradation of their key habitats through a variety of human activities.

##### ***Land use change and uncontrolled economic development***

In recent years there has been an enormous surge in development of urban, industrial and tourist areas along some parts of the Red Sea and, to a lesser extent, Gulf of Aden coasts. This has been associated with an inevitable increase in transport infrastructure such as roads and ports. Over the past three decades Saudi Arabia has undergone a rapid transformation into a modern industrialised country (PERSGA/GEF 2001). By the mid 1990's, over 15.2 % of the population were living along the Red Sea coast (MINISTRY OF PLANNING 1995), and a considerable number of large scale projects – recreational facilities, hotels and restaurants – had been developed, particularly around the Jeddah area.

Development in some countries has been undertaken with little planning, control or foresight and usually without any form of environmental impact assessment conducted prior to construction. In many cases this has led to the direct destruction of seabird nesting sites and, to a lesser extent, feeding areas. In Egypt, for instance, the national policy to shift the concentration of population from along the Nile to Red Sea coastal areas has led to the loss of large areas of coastal and reef habitats through the development of urban infrastructure. In addition, construction of associated roads has altered surrounding hydrology, impacting mangrove stands along the Egyptian Red Sea coast.

The attractive marine life and favourable climate have encouraged the rapid development of a major tourist industry on the coasts of the Red Sea. Tourism in Egypt, a large proportion of which is nature-based, represents the main economic activity along the Red Sea coast and is a growing sector in the nation's tourism industry (PERSGA/GEF 2001). Large expanses of the coast have been developed into beach resorts, particularly around Hurghada and Sharm el Sheikh but also at Dahab, Nuweiba and Taba on the Gulf of Aqaba coast, at Safaga and Quseir on the Red Sea coast, and along the northern sector of the Gulf of Suez. It has been reported that areas such as Hurghada and Sharm el Sheikh have been developed and exploited beyond their ecological and social carrying capacities and are already showing signs of environmental degradation, even in protected areas such as the Ras Mohammad National Park in Egypt. Tourist pressure has already caused a negative impact on breeding terns on some inshore islands (HOATH et al. 1997) and a similar situation is reported on Moucha and Maskali Islands protected area in Djibouti (SHOBRAK et al. 2002a).

Development does not need to occur at an actual breeding site to have an impact. The increased noise, pollution, visitor disturbance, and predation by cats and rats from nearby developments can lead to nesting sites being abandoned. For instance, urban expansion on the mainland has caused breeding failure of seabirds at the nearby Sa'adadin (Saad ad-Din) Islands. Similar situations have been recorded from the Moucha and Maskali Islands off Djibouti, Zuqar Island, the Hanish Islands, and Al-Zubayr Island off Yemen (some of these due to occupation by military bases).

### ***Habitat degradation***

Many coastal marine habitats such as shallow bays, mangroves and seagrass are of considerable importance to the seabirds of the Region because they are key feeding grounds or habitats. Seagrass beds are particularly important because they occur in shallow and sheltered waters throughout much of the Region and their productivity is greater than comparable areas of both coral reefs and mangroves. Many species of fish and crustaceans, including commercially important species, use seagrass beds as nursery grounds. Seagrass beds are therefore a major feeding habitat for nesting seabirds, especially terns and gulls, but their location in shallow waters close to the shoreline renders them susceptible to urban, industrial, tourism, and fishing related impacts. These problems are compounded by a lack of awareness about the importance of seagrasses, and a lack of information on their distribution. Although seagrass beds are legally protected from trawling, they are destroyed by illegal trawling due to poor law enforcement.

Mangroves are also important for seabirds as they are nurseries and feeding grounds for many marine fish and crustacean food sources. However, they are also subject to significant degradation and are, therefore, themselves the subject of a PERSGA RAP (KHALIL 2003). Although there are still healthy stands of mangroves fringing many parts of the RSGA coasts and islands, particularly in the southern Red Sea, many areas are threatened by overgrazing of livestock such as camels and extensive cutting and collection for firewood (PERSGA/GEF 2001). Apart from damage to mangroves around urban areas, establishment of military bases (which has increased in recent years) and new settlements of fishermen, have led to a dramatic increase in fuel wood collection and damage to fragile vegetation on some islands in the Region. Wood may also be cut for construction purposes and fish traps. In addition, the damming of rivers and wadis has reduced natural freshwater inputs to the coast and degraded mangrove stands, and causeways constructed across bays have reduced the tidal exchange of seawater leading to extensive mangrove death.

The number of shrimp farms is growing in the Region and this poses a potential threat to marine life including seabirds. Shrimp farming activities are often very damaging to the ecological equilibrium of neighbouring lagoons. Shrimp farms are usually sited in low tide and mangrove areas and inevitably affect these fragile ecosystems.

In addition to direct destruction of coastal areas, suspended fine sediments from dredging and infilling operations in shallow water areas, excavation of artificial lagoons, construction of huge marine structures and coastal mining and quarrying can inflict widespread damage to important seabird feeding habitats many kilometres from the source.

## **5.5 Pollution**

Pollution in the Region comes from oil production and transportation accidents, sewage discharges and the disposal of solid, industrial and agricultural waste, all of which impact on seabird populations. The situation may be made worse by inadequate or insufficient use of Integrated Coastal Zone Management (ICZM) and Environmental Impact Assessments (EIAs), together with the lack of national environmental strategies and action plans in some RSGA countries. Such measures could help considerably to reduce pollution from land-based sources.

Pollution in small or semi-enclosed seas where there is little water exchange, such as the Red Sea, can cause severe damage to the marine environment. The situation is most serious in the Gulf of Aqaba where retention time of the water is about two years. Hence, the pollutants that enter the Gulf will remain, with little dispersion, for long periods of time and consequently will have particularly detrimental effects on marine life and habitats.

### ***Oil pollution***

Oil pollution is major hazard to the RSGA environment. Much of the world's crude and refined oil cargoes pass through the Region, with between 20,000 and 35,000 oil tankers entering the Region each year (PERSGA/GEF 1998); thus the likelihood of an accidental oil spill is high. The Red Sea receives 6,836 mt or 14.61 kg of oil per square kilometre per year from shipping (AWAD 1995). Dirty ballast water dumped from ships results in the formation of tar balls and these have been found along the coastline of both the Red Sea and Gulf of Aden (RUSHDIE et al. 1991; EC & MFW 1995; PERSGA/GEF 2001). Globally, average pollution from oil refineries amounts to 0.56 kg per square kilometre per year, whereas the Red Sea receives 6.64 kg per square kilometre per year, nearly 11 times higher.

The impact of oil on seabirds and other marine life can be devastating as evident from major spills in other parts of the world (for example, see review by NISBET 1994), and the RSGA Region has had its fair share of 'tragedies'. In 1960, for instance, more than 800 Socotra Cormorants were found near Aden killed by oil pollution (GALLAGHER et al. 1984). Although there has been no formal assessment of the recent Limburg oil spill that occurred between Al Mukalla and Bir Ali in the Gulf of Aden, a tour party reported that beaches were badly fouled with oil and covered with thousands of feathers (JENNINGS 2003).

Although oil pollution mostly affects diving birds such as cormorants, auks and divers, it can also cause damage to other seabirds at various stages of their life cycle. Large numbers of adults can be killed by oil-fouling and washed up oil can have a severe impact on flightless chicks on beaches near the colonies. Oiling of eggs by contaminated incubating birds can also cause serious problems (FREEDMAN 1989). Oil spills also affect seabirds indirectly through the food chain, as toxic hydrocarbons can damage the ecosystems which support the birds' food resources, and can disrupt the breeding cycles of prey fish species.

### ***Sewage***

Sewage is an important environmental problem in some parts of the Region. Sewage is generally only treated from major urban areas and many, if not most, of the treatment plants along the Red Sea and Gulf of Aden are overloaded and inadequate. Most small towns and many tourist facilities along the Red Sea and Gulf of Aden discharge directly to the sea, although this varies by country and location. Considerable amounts of sewage are also discharged directly into the Red Sea and Gulf of Aden by cargo vessels, tour boats, ferries and private yachts, which typically do not store sewage for later treatment on land.

In high concentrations sewage can negatively impact fish and invertebrates in important feeding areas for seabirds, such as mudflats, and can kill off mangroves. However, overall impacts on seabirds are likely to be slight, or even beneficial for some scavenging species, such as gulls.

### ***Solid, industrial and agricultural wastes***

Solid waste is another (largely indirect) threat to breeding seabirds in coastal areas and islands of the RSGA Region. This originates from domestic and industrial materials washed out to sea, thrown overboard from ships, or deliberately dumped from land. Solid waste washes up on nesting beaches causing a particular hazard to young birds and chicks, and may entrap adult birds while foraging. There is also the possible threat of leaks from landfill sites situated near the coast. In some countries, wetland and marine areas are often favoured areas for dumping of building wastes. Solid waste is considered a particular problem in most countries, where beaches and near-shore reef and seagrass areas are heavily polluted by discarded plastic and other refuse materials.

Coastal industries in the Region include power and desalination plants, oil refineries, petrochemical plants, tanning factories and fertilizer and food manufacturers, as well as loading and transport facilities. These industries and their effluents (oil, organic pollutants, heavy metals, large amounts of heated brine and chlorinated cooling water) are considered important problems in every country of the Region and are often major polluters. Problems are likely to be most severe where there are particular concentrations of industries, such as along the Jordanian coastline of the Gulf of Aqaba, around the Jeddah and Yanbu areas in Saudi Arabia and in the Suez area. Regulations governing acceptable levels of industrial discharges into the coastal and marine environment are inadequately enforced in the Region and the resulting impact on the marine ecosystems of the RSGA and the region's seabirds in particular is poorly known.

Fertilizer and pesticide residues are discharged into the RSGA as a result of agricultural run-off, probably most often as concentrated bursts following rain when wadis (dry river beds) fill. The effects of these discharges on seabirds are most likely to be indirect through poisoning of prey species and disruption of the food chain. Extensive use of pesticides, insecticides and herbicides for agriculture and other purposes is known to occur along the coasts of Sudan, Yemen and Somalia. For instance, potential hazards along Sudan's Red Sea coast include effluent from the Tokar Delta Agricultural Scheme and the country's Locust Control Programme, which is probably the largest in Africa and the Middle East.

## **5.6 Impact of fisheries**

### ***Over-fishing***

Despite the importance of fisheries to national economies, the status of fisheries in some nations of the Region is not well known because of deficiencies in stock assessments and incomplete fisheries statistics. However, over-fishing has been documented as one of the threats to the living marine resources in all countries of the Region (PERSGA/GEF 2001). Apart from fish, catches of lobster and strombids have declined, cuttlefish stocks have collapsed and there is evidence that shrimp populations (a major food source for many seabirds) are being depleted.

In Yemen, over-fishing is a particular problem. This is attributed to badly monitored foreign vessels trawling close to shore causing massive damage to coral reefs and shallow waters; shrimp fishing, particularly at khawrs and bays near Kamaran Island, the islands around Hodeidah (Al-Hudaydah) and islands close to the border with Saudi Arabia; and trawling in

shallow waters using fine nets which harvest most small fish (important food sources for seabirds). Collectively, these practices are causing massive depletion of the fish stocks. Unsustainable and environmentally damaging fishery practices impacting seabirds have also been recorded in Egypt (BAHA EL DIN et al. 2003) and Saudi Arabia (TATWANY et al. 1995). It is also believed that an increase in poverty among coastal communities in most of the RSGA countries has led to an increase in the numbers of fishermen, causing extra pressure on marine resources.

Studies in the Farasan Islands, Saudi Arabia, have shown that terns tend to feed in water close to their nesting colonies (SWEET 1994; SIMMONS 1994) and the same is true for many other seabird species (see Annex 2). Consequently, unsustainable fishing activity around islands in the RSGA is likely to adversely impact the breeding success of their seabirds.

Ultimately, indiscriminate over-fishing, destruction of spawning, nursery and feeding grounds, inappropriate resource use and inadequate fisheries regulations, coupled with poor law enforcement not only affect seabird populations through reduced food supplies but threaten the livelihoods of a wide range of people engaged in potentially sustainable activities such as artisanal fishing, aquaculture and tourism.

### ***Incidental catch of seabirds***

Long-line fishing is not considered a big problem in the RSGA Region, unlike other seas of the world where it is a major cause of mortality to albatrosses and petrels. None of the fishermen interviewed by AL-SAGHIER (2002a) in the Yemeni Red Sea reported catching seabirds using line fishing, probably, in part, because of the short lengths of line employed. Although little is known about Jouanin's Petrel it does not appear to commonly follow ships, which would put it at increased risk from long-lining.

There are reports of seabirds occasionally getting trapped in fishing nets in the Region, such as feeding flocks of Socotra Cormorant, and fishermen do sometimes kill cormorants and pelicans found in their fishing nets (GALLAGHER et al. 1984). However, numbers killed are probably low.

In general, there is a lack of data on fisheries and their impact on seabirds in the RSGA Region and research is needed at both national and regional levels.

## **5.7 Global warming**

The now uncontested rise in global temperatures due to the accumulation of 'greenhouse gases' such as carbon dioxide and methane is predicted to have major impacts on all life on this planet. Coastal areas and low-lying islands, such as those along the RSGA, are likely to be lost to significant rises in sea level as glaciers and land-locked ice sheets in Antarctica and elsewhere melt and other physical processes intervene. Thus, important seabird nesting areas are expected to be lost leading to changes in feeding areas and possibly food sources. Exact effects are still difficult to predict, particularly at the species level, as are timescales. However, one clear example of the impact of global warming that has already occurred in the Red Sea is the bleaching and death of corals (PERSGA/GEF 2001).

## **5.8 Threats to individual species and key sites in the RSGA Region**

The threats described above are generic in that they probably affect all the breeding seabird species of the RSGA, although their impact will differ between species and areas.

### ***Threats to individual species***

Many species, particularly the gulls and terns, are considered at high risk from a multitude of threats but some threats, notably human disturbance, introduced predators and invasive species, habitat destruction and degradation, and human exploitation are of particular concern.

Table 3 shows an attempt to quantify these threats, presenting an assessment of the degree of threat from the above activities for each of the 17 breeding seabird species in the Region. The assessments are based on analysis of the country seabird status reports, unpublished data and the opinions of experts from around the RSGA Region, but they are not based on comprehensive, detailed, quantitative research. Therefore, the predicted impacts on individual species should be treated with caution (especially for species that have been less well studied). However, it is considered that the combined assessment across all species is sufficiently reliable to give a broad indication of the likely total impact of the threats on priority species. Two points are particularly noteworthy. Firstly, these assessments are at a regional scale and the magnitude of impacts may vary considerably when assessed at smaller scales (national, local or site populations). Second, where a threat is not listed as having an impact on an individual species, this should not be interpreted as proof that there is no effect or impact, but merely that no harmful effects or impacts have been discovered so far.

Adding all values for the 17 species to obtain a total score for each threat shows that human disturbance, human exploitation, marine pollution, habitat destruction and degradation, and introduced predators and invasive species are all important threats, although marine pollution appears to be a particularly common threat. Furthermore, 'weighting' the scores according to the conservation importance of each species shows a similar ranking. Thus, the threats to important seabirds are common to other species. In turn, this indicates that focusing actions on key threats will address the conservation needs of the most important seabird species and the seabird community in general.

### ***Threats to important sites for breeding seabirds in RSGA***

Table 4 gives a similar assessment for the IBAs in the RSGA Region considered most important for breeding seabirds, identified in Section 4.4.

**Table 3. Assessment of impacts of threats on individual species of breeding seabird in the RSGA Region**

**Key to threat scores.** If threats continue as expected from current knowledge, it is predicted that RSGA population impacts will be: \* = Low (occasional losses of birds and eggs but no population decline >20% over the next 20 years); \*\* = Serious (predicted RSGA population decline of over 20% over next 20 years); \*\*\* = Critical, (extinction as a breeding species within the RSGA Region over the next 20 years); ID = Insufficient data.

In order to assess the relative importance of the various threats a ‘Threat Score’ and ‘Weighted Threat Score’ has been derived for each threat. The former is the sum of all impact scores for a particular threat. The latter is the sum of each threat score weighted (multiplied) according to the priority status of the particular species affected. Threat scores are: Low = 1; Serious = 5; Critical = 10. Priority weightings for species (based on Table 2), are: Priority Species A = 10; B = 6; C = 3; D = 1.

Species	Priority score*	Human disturbance	Human exploitation	Habitat destruction and degradation	Pollution		Impact of fishing	Invasive/introduced predators	Global warming	Total threat score
					Marine	Terrestrial				
Jouanin’s Petrel <i>Bulweria fallax</i>	6	*	*	*	**	*	ID	*	*	11
Persian Shearwater <i>Puffinus persicus</i>	6	*	*	*	**	*	ID	*	*	11
Red-billed Tropicbird <i>Phaethon aethereus indicus</i>	3	*	*	*	**	*	ID	*	*	11
Brown Booby <i>Sula leucogaster plotus</i>	1	**	**	**	**	*	ID	**	*	27
Masked Booby <i>Sula dactylatra</i>	6	**	*	**	**	*	ID	**	*	23
Socotra Cormorant <i>Phalacrocorax nigroularis</i>	10	**	**	**	**	*	ID	**	*	27
Sooty Gull <i>Larus hemprichii</i>	3	**	**	**	*	*	ID	*	*	19
White-eyed Gull <i>Larus leucophthalmus</i>	10	**	**	**	**	*	ID	**	*	27
Caspian Tern <i>Sterna caspia</i>	1	**	**	**	**	*	ID	**	*	27
Swift Tern <i>Sterna bergii velox</i>	6	**	**	**	**	*	ID	**	*	27
Lesser Crested Tern <i>Sterna bengalensis</i>	1	**	**	**	**	*	ID	**	*	27
White-cheeked Tern <i>Sterna repressa</i>	1	**	**	**	**	*	ID	**	*	27
Sooty Tern <i>Sterna fuscata</i>	1	**	**	**	**	*	ID	**	*	27
Bridled Tern <i>Sterna anaethetus</i>	1	**	**	**	**	*	ID	**	*	27
Little Tern <i>Sterna albifrons albifrons</i>	1	***	***	**	**	*	ID	***	*	42
Saunders’s Little Tern <i>Sterna saundersi</i>	1	**	**	**	**	*	ID	**	*	27
Brown Noddy <i>Anous stolidus</i>	1	*	*	*	**	*	ID	*	*	11
Low impact		4	5	4	1	17	0	5	17	
Medium impact		12	11	13	16	0	0	11	0	
High impact		1	1	0	0	0	0	1	0	
<b>Total threat score</b>		<b>74</b>	<b>70</b>	<b>69</b>	<b>81</b>	<b>17</b>	-	<b>70</b>	<b>17</b>	
<b>Weighted threat score</b>		<b>236</b>	<b>212</b>	<b>231</b>	<b>283</b>	<b>59</b>	-	<b>224</b>	<b>59</b>	

**Table 4. Preliminary assessment of impacts of threats to key seabird breeding sites in the RSGA Region**

**Key to threat scores.** If threats continue as expected from current knowledge, it is predicted that impacts will be: \* = Low (occasional losses of birds and eggs, but no site decline >20% over the next 20 years); \*\* = Serious (predicted population decline of over 20% over next 20 years); \*\*\* = Critical (extinction at site predicted over next 20 years); ID = insufficient data.

Site	IBA No.	Human disturbance	Human exploitation	Habitat destruction and degradation	Pollution		Impact of fishing	Introduced/invasive species	Predicted impact of global warming
					Marine	Terrestrial			
<b>Djibouti</b>									
Isles des Sept Frères	DJ004	**	**	**	***	***	ID	**	*
Moucha and Maskali Islands		***	***	***	***	***	***	***	*
<b>Egypt</b>									
Hurghada Archipelago	EG015	***	ID	***	***	***	***	**	*
Tiran Island	EG016	**	**	***	ID	ID	ID	*	*
Wadi Gimal (Jimal) Island	EG017	***	**	*	***	**	**	*	*
Qulân Islands	EG018	***	**	*	**	**	**	*	*
Zabargad Island	EG019	***	*	*	*	*	*	*	*
Siyal Islands	EG020	**	**	*	*	*	**	*	*
Rawabel Islands	EG021	**	**	*	*	*	**	*	*
<b>Saudi Arabia</b>									
Al Wajh Bank	SA011	**	**	***	**	**	***	***	*
Madinat Yanbu al-Sinaiyah	SA016	*	*	*	**	**	**	**	*
Qishran Bay	SA025	***	***	***	ID	ID	*	*	*
Umm al-Qamari	SA026	***	***	**	*	**	**	*	ID
Farasan Islands	SA038	**	***	**	**	**	**	**	*
<b>Somalia</b>									
Jasiira Ceebaad (Aibat island) and Sa'adadin Island (Jasiira Sacaada Din or Saad ad Din Island)	SO001	***	***	***	ID	ID	*	***	ID
Jasiira Maydh (Mait Island)	SO002	***	***	***	ID	ID	ID	***	ID

Site	IBA No.	Human disturbance	Human exploitation	Habitat destruction and degradation	Pollution		Impact of fishing	Introduced/invasive species	Predicted impact of global warming
					Marine	Terrestrial			
<b>Sudan</b>									
Mukawwar Island and Dungonab Bay	SD002	***	**	***	ID	ID	ID	***	*
Suakin Archipelago	SD004	**	***	***	***	ID	***	***	*
<b>Yemen</b>									
Midi – Luhayyah	YE001	**	**	***	**	***	**	**	*
Islands north of Al-Hudaydah	YE004	***	***	**	**	**	**	***	*
Bahr Ibn Abbas-Ra's Isa	YE007	***	***	***	**	**	**	***	*
Al-'Urj	YE010	***	**	***	**	**	**	***	*
Jaza'ir Al-Zubayr	YE012	***	**	**	*	*	*	***	ID
Nukhaylah-Ghulayfiqah	YE015	***	***	***	**	**	**	***	*
Jaza'ir al-Hanish	YE 019	***	***	**	**	*	**	***	ID
Bab-al-Mandab-Mawza (incl. Mayun Is.)	YE022	***	***	***	***	**	**	***	*
Islands off Bir Ali	YE 030	***	***	**	*	*	**	***	ID
Jabal Ma'lih Escarpment/Badiya Qalansiya	YE036	*	*	*	*	*	*	*	*
Ra's Momi and Fikhah	YE051	*	*	*	*	*	*	**	*
Sabuniya and Ka'l Fir'awn, (Socotra)	YE 054	**	**	**	*	*	ID	**	*
Abd Al-Kuri (Socotra)	YE 055	**	**	**	*	*	ID	***	ID
Al-Ikhwān	YE 056	*	*	*	*	*	ID	***	ID

## **6. CURRENT CONSERVATION ACTIONS FOR BREEDING SEABIRDS IN THE RED SEA AND GULF OF ADEN**

### **6.1 International environmental initiatives covering the RSGA Region**

#### *International environmental conventions and agreements*

The global conventions most relevant to the seabirds of the RSGA Region are those dealing with conservation of biodiversity, such as the Convention on Biological Diversity (CBD) and the Convention on Migratory Species (CMS or Bonn Convention) and with pollution, particularly marine and oil pollution agreements such as MARPOL 73/78. There are also several relevant regional environmental conventions, the most important of which is the Jeddah Convention (which has led to the creation of PERSGA and its current Strategic Action Programme). The ratification status of each in the RSGA Region is given in Table 5, and brief descriptions of each convention or agreement are given in Annex 5.

The various global and regional conventions and directives listed in Table 5 represent a strong basis for international co-operation among PERSGA members for the conservation of the wider environment and shared natural resources.

#### *PERSGA programmes*

As part of its Strategic Action Programme PERSGA has developed and implemented several regional and national programmes that directly benefit seabird conservation. These include:

- The development of a regional environmental monitoring programme (REMP) in co-operation with the Coordinating Unit of the Mediterranean Action Plan and the Marine Environment Laboratory of the International Atomic Energy Agency (Monaco).
- A new vessel traffic separation scheme for the southern Red Sea, initiated through PERSGA and supported by The World Bank and the United Kingdom Hydrographic Office (UKHO). This was approved by the International Maritime Organization (IMO) and came into operation in July 2003. It will make a substantial improvement to navigation safety in the Region and reduce the risk of shipping accidents and marine pollution.
- Preparation of a regional Programme of Action for the protection of the marine environment from land based activities, with the support of UNEP/GPA and the implementation of two national Programmes of Action (Egypt and Yemen), in co-operation with UNEP/GPA.
- In addition, the IMO's Marine Environment Division, in close co-operation with PERSGA, has funded the preparation of a Regional Action Plan to cover the development of National Systems and Regional and Sub-Regional mechanisms to prepare for and respond to major marine oil spills in the Red Sea and Gulf of Aden. Some initial funding through the IMO's Integrated Technical Co-operation Programme will allow this Plan to be started. The IMO will work with PERSGA to find donors who will support the full implementation of the Action Plan.

#### *Regional legal instruments in development*

Drafts of two protocols have been prepared: a Protocol on the Protection of the Marine Environment from Land-based Sources of Pollution in the Red Sea and Gulf of Aden, and a Protocol Concerning the Conservation of Biological Diversity and the Establishment of Protected Areas for the PERSGA Region.

**Table 5. Ratification status of biodiversity- and marine-protection related conventions relevant to seabird conservation in the Red Sea and Gulf of Aden, as of July 2003**

	Djibouti	Egypt	Jordan	Saudi Arabia	Somalia	Sudan	Yemen	Countries signed/ ratified
<b>Global</b>								
CBD	CP	CP	CP	CP		CP	CP	6
Ramsar	CP	CP	CP					3
WHC		CP	CP			CP	CP	4
CMS		CP	CP	CP	CP			4
AEWA	CP	CP	CP			CP		4
CITES	CP	CP	CP	CP	CP	CP	CP	7
UNESCO MAB		P				P		0
UNFCCC	CP	CP	CP	CP		CP	CP	6
UNCLOS	CP	CP	CP	CP	CP	CP	CP	7
Basel	CP	CP	CP	CP			CP	5
MARPOL 73/78	CP	CP						2
<b>Regional</b>								
Jeddah	CP	CP	CP	CP	CP	CP	CP	7
IGADD					P	P		0
ACCNNR	CP	CP				CP		3
Nairobi					CP			1
PPAWFEAR					CP			1
PCCCMPCEEAR					CP			1

CP = Contracting Party (has ratified or acceded to Convention), S = Signatory, P = Participating Member

#### **Global**

CBD: Convention on Biological Diversity

Ramsar: Convention on Wetlands of International Importance especially as Waterfowl Habitat

WHC: Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention)

CMS: Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)

AEWA: Agreement on the Conservation of African-Eurasian Waterbirds (Agreement under the Bonn Convention)

CITES: Convention on International Trade in Endangered Species of Wild Fauna and Flora

UNFCCC: United Nations Framework Convention on Climate Change

Basel: Convention on Control of Trans-boundary Movements of Hazardous Wastes and their Disposal

MARPOL 73/78: International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978

#### **Regional**

Jeddah: Regional Convention for the Conservation of the Red Sea and Gulf of Aden Environment, together with its Protocol concerning Regional Co-operation in Combating Pollution by Oil and Other Harmful Substances in Cases of Emergency

IGADD: Inter-governmental Authority on Drought and Development

ACCNNR: African Convention on the Conservation of Nature and Natural Resources

Nairobi: Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Eastern African Region

PPAWFEAR: The Protocol concerning Protected Areas and Wild Fauna and Flora in the Eastern African Region

PCCCMPCEEAR: Protocol Concerning Co-operation in Combating Marine Pollution in Cases of Emergency in the Eastern African Region

## **6.2 National legislation and implementation of international agreements in PERSGA countries**

### ***Implementation of international agreements***

Most countries in the region have well-established environmental legislation, although in some this legislation probably needs updating to take into account the increased pressures on the environment and threats to biodiversity of the RSGA Region in recent years. A summary list of some of the key environmental legislative instruments affecting seabirds is presented in the Regional Seabird Status Report (PERSGA/GEF 2003a) and PERSGA is currently carrying out a further detailed review of its member states' ratification and national implementation of international agreements.

Parties to the CBD are required to prepare national strategies, plans or programmes for the conservation and sustainable development of the nation's natural resources and to integrate these into other relevant sectoral and cross-sectoral plans, programmes and policies. Usually, this is achieved through National Biodiversity Strategies and Action Plans (NBSAP), or similarly titled documents. Although six of the seven PERSGA countries have ratified or acceded to the CBD, only four have so far produced NBSAPs. These are Djibouti, Egypt, Saudi Arabia and Yemen.

### ***Site protection measures – Marine Protected Areas***

Most marine protected areas (MPAs) in the region follow the IUCN multiple-use model, whereby different habitats or areas are afforded various levels of protection and use through application of a zoning plan (CHILD & GRAINGER 1990). There are only 11 established MPAs in the RSGA Region that are important for breeding seabirds, although a further 23 have been proposed, making a total of 34 MPAs. This figure is different from the number of IBAs considered important for seabirds (31) because the IBAs and MPAs do not overlap in all cases and several IBAs may be located within the boundaries of an MPA and vice versa. Many of the existing MPAs suffer from lack of resources and political interest, and have been little more than 'paper parks', although the GEF-sponsored Strategic Action Programme (SAP) has been trying to address these problems through one of its eight Components.

A list of the existing and proposed MPAs in the RSGA Region that are important for breeding seabirds is given in Table 6.

**Table 6. Existing and proposed marine protected areas in the RSGA Region that are important for breeding seabirds**

	Status	Size (km <sup>2</sup> )	Breeding seabirds	Comments
<b>Djibouti</b>				
Moucha Island	Established		Red-billed Tropicbird, White-eyed Gull, Sooty Gull, Bridled Tern, White-cheeked Tern, Lesser Crested Tern, Swift Tern, Brown Noddy	
Maskali Island	Established		Red-billed Tropicbird, White-eyed Gull, Sooty Gull, Bridled Tern, White-cheeked Tern, Lesser Crested Tern, Swift Tern, Brown Noddy	
Isles des Sept Frères	Proposed		Red-billed Tropicbird, Brown Booby, White-eyed Gull, Sooty Gull, Swift and Lesser Crested terns.	Also has breeding Western Reef Heron, Little Green Heron, Osprey and Sooty Falcon; important for migrating raptors crossing the Bab al Mandab Straits
<b>Egypt</b>				
Ras Mohammed National Park	Established	480	Seabirds breed on Tiran Island and in mangroves at Ras Mohammed	Tidal flats along the Gulf of Suez coast are feeding and roosting sites for seabirds
Nabaq Protected Area	Established			Contains most extensive mangrove in the northern Egyptian Red Sea and most northerly mangrove in the world
Gabel Elba Protected Area	Established		Seabirds said to breed on the islands and in mangrove areas but have never been adequately surveyed	Largest protected area in Egypt with largest area of mangroves in country
Wadi El Gimal-Hamata Protected Area	Established			Egypt's newest reserve, established January 2003
Red Sea Islands and Mangroves Protected Area	Established			Originally an extension of the Gabel Elba Protected Area now being managed as a separate protected area; includes the islands off the coast of Hurghada, Zabargad Island and the other islands to the south that are not part of the other protected areas and coastal mangroves from north of Hurghada south to Wadi Gimal
<b>Saudi Arabia</b>				
Yanbu Royal Commission Protected Area	Established	c. 5	Saunders' Little Tern and White-cheeked Tern	Protected by the Royal Commission through an agreement with MEPA
Umm al Qamari	Established	0.1	Swift Tern, Brown Booby and Sooty Gull	Also important breeding site for African Collared Dove, Little Green Heron, Reef Heron and Cattle Egrets
Farasan Islands	Established	3,310	Large proportion of the Red Sea's seabirds breed in the archipelago	Also important habitat for mangroves, seagrasses, coral reefs, marine mammals, marine turtles and an endemic gazelle
Straits of Tiran	Proposed			Also contains important marine turtle and dugong habitat
Ras Suwayhil	Proposed	267		Also contains suitable habitat for dugong
Sharm Zubayr	Proposed	80		Supports the northernmost mangroves in the Red Sea
Ghubbat Bal'aksh	Proposed	33		Supports coral reefs with particularly high species diversity
Al Wajh Bank (Archipelago), including Sharm Habban and Sharm Munaybirah	Proposed	2,840		The most extensive coral reef system of the entire Red Sea, diverse reef-associated fauna, seagrass beds and mangroves and a key area for dugong
Qalib Islands	Proposed			Also important for nesting marine turtles

	Status	Size (km <sup>2</sup> )	Breeding seabirds	Comments
Al-Hasani and Libanah Islands, including Ras Abu Madd and Sharm Hasi	Proposed			Also important for nesting marine turtles
Ras Baridi and Sharm Al-Khawr	Proposed			Most important marine turtle nesting site in Red Sea
Shi'b al-Qirin	Proposed	30		Also important for its high quality inshore reef complex
Ras Hatiba	Proposed	c. 450		Prime site for environmental education projects
Ash-Shu'aybah and Mastaba	Proposed	c. 100		
Qishran Bay	Proposed			Also important dugong habitat
Outer Farasan Bank	Proposed			Also important for nesting turtles
Khawr Itwad	Proposed	c. 70		
Shi'b Abu al-Liqa and Shi'b al-Kabir	Proposed	c. 140		Support abundant fringing corals and mangroves
<b>Somalia</b>				
Aibat and Sa'adadin Islands	Proposed	c. 300	No recent information on the avifauna in the islands, but White-eyed Gull bred in thousands on both islands during the first half of the twentieth century; Sooty Gull and White-cheeked, Swift, and Lesser Crested Terns, Brown and Masked Booby also said to occur	Contains possibly the largest coral reef area in the Gulf of Aden; Sa'adadin Island has the largest mangrove stands and coral reefs along the Gulf of Aden coast of Somalia; in addition, numerous species of Palearctic migrant waders and waterfowl, exceeding 20,000 birds, occur seasonally
Mait Island	Proposed	c. 1	Old records estimated 100,000 breeding seabirds, including Red-billed Tropicbird, Masked Booby, Sooty Tern and Bridled Tern; no recent information	Isolated, steep-sided granitic island
<b>Sudan</b>				
Mukawwar Island and Dunganab Bay	Proposed	300	Sooty Gull, White-eyed Gull, Bridled tern, White-cheeked tern	Also supports breeding colonies of Osprey, Sooty Falcon and Crab Plover; Mukawwar Island is important for breeding turtles
Suakin Archipelago	Proposed			
<b>Yemen</b>				
Socotra Island Group Protected Area	Established	3,626	Jouanin's Petrel, Persian Shearwater, Masked Booby and probably Socotra Cormorant	Extremely important area for marine biogeography
Belhaf and Bir Ali area	Proposed		Socotra Cormorant	
Ras Isa/Kamaran Island	Proposed		Socotra Cormorant, Bridled Tern	
Bab al-Mandab	Proposed		Common Noddy, Masked Bobby	
Sharma-Jathmon	Proposed		Sooty Gull, terns	
Hawf	Proposed		Migratory species	
Luhayyah	Proposed		Bridled tern, White-eyed Gull	

## **7. OVERALL CONSERVATION OBJECTIVES**

The overall objective of the Regional Action Plan for the Conservation of Breeding Seabirds and their habitats in the Red Sea and Gulf of Aden Region is:

*The conservation of the breeding seabirds of the Red Sea and Gulf of Aden Region and their habitats for the use and enjoyment of present and future human generations, and for their intrinsic biodiversity, ecological, aesthetic and other values from which human benefits accrue.*

### **Specific objectives**

- i. Prevent the global extinction of any seabird occurring in the Region
- ii. Maintain existing regional and national populations within limits of acceptable change\*
- iii. Restore populations of threatened species to target levels\*
- iv. Restore degraded key habitats and sites important for breeding seabirds to target levels

\* Limits of acceptable change and target levels for restoration of species populations will be set at the implementation stage of the RAP to enable consideration of available resources and priorities for action in other RAPs.

In order to meet these aims and objectives, a Framework for Action has been developed.

## **8. FRAMEWORK FOR ACTION**

### **8.1 Introduction to the Framework**

The Framework for Action takes an integrated multi-dimensional approach. It is based on the format developed for the Regional Action Plan for the Conservation of Coral Reefs in the Red Sea and Gulf of Aden (PERSGA/GEF 2003b), since many of the threats to the Region's coral reefs are also faced by seabirds. Consequently, there are many common objectives and actions. Furthermore, many of the actions are applicable to the conservation of other coastal species and habitats because of their shared use of the same RSGA sites and habitats. RAPs are also being produced for mangroves and marine turtles. Adopting a common approach among the RAPs reinforces the need for action, aids integration between different programmes and increases the likelihood of overall success of all plans.

The Framework for Action for breeding seabirds is constructed around seven key 'Components' that it is believed, if implemented will meet the aims and objectives set out in the previous section. These are:

1. Integrated Coastal Zone Management Planning for Seabirds
2. Education, public awareness and community participation
3. Site and habitat protection and management
4. Regulation of human exploitation
5. Research and monitoring
6. Legislation
7. Institutional capacity building and training

These key areas have been identified through consultation with seabird experts at national and regional levels and reflect recommendations set out in the Regional Seabird Status Report (PERSGA/GEF 2003a) and the national seabird status reports.

For each component, principal objectives are defined, recommended actions briefly described and priorities identified. Priorities are based on an analysis of the severity of particular threats to seabird species in the RSGA Region (Table 3), the potential impact of the action on the threat (Annex 6) and practicalities affecting implementation (such as funding constraints and opportunities, the potential for combined actions common to other RAPs, the likelihood of success and levels of public support). The priority and level of urgency for each action is indicated as:

- \*\*\* = very urgent action, for example, where immediate action or intervention is required;
- \*\* = urgent action, for example, where intervention is required over the five year RAP period to ensure the continued viability of species of regional - global importance;
- \* = priority action, where there is an institutional set-up or there are on-going projects and opportunities for synergies with existing efforts.

Designation of a level of priority to each specific action allows a phased approach to implementation and aids budget, programme and project planning and capacity building.

## **8.2 General approach to implementation**

### ***Implementation***

It is suggested that a RAP Steering Committee is established to promote, coordinate and integrate the implementation of this and other RAPs. The Committee should include representatives from each participating nation and the major international, regional and national organisations including PERSGA focal points, the BirdLife Middle East Office, UNEP-ROWA and UNDP. This body would oversee implementation and monitoring of the RAP and its incorporation into national policy, legislative and investment frameworks, over its initial five year period. The Steering Committee would act as the interface between government, major donor agencies and other relevant international initiatives. The Terms of Reference for the Steering Committee should be developed by PERSGA in consultation with the national focal points. In addition, a Regional Seabird Coordinator may be appointed to work within PERSGA, to direct the day-to-day implementation of the RAP.

It is not currently possible to identify national priorities, responsibilities, time-scales and budgets for implementing the proposed RAP actions as these will vary considerably between the PERSGA member countries and will need to take into account likely funding availability and the needs of other RAPs. In some cases there may be competing requirements for funding across the RAPs but in many other cases there will be opportunities for combined actions that meet multiple objectives. It is therefore proposed that national implementation priorities, time-scales and responsibilities are identified at a later stage by the RAP Steering Committee, or as part of the development of National Action Plans.

It is envisaged that regional groups and specialists will carry out the bulk of the implementation of this RAP but international exchange of knowledge and experience, including establishment of international partnerships, is considered to be important for long-term success. However, international consultants should only be involved where the required expertise is not available in the RSGA Region. Their main task will be to transfer knowledge and experience. Systems should be put in place to ensure that all data gathered by international consultants is made available to PERSGA and the participating countries. NGOs should also be heavily involved in both the design and implementation of the RAP.

In order to ensure the long-term success and sustainability of the RAP beyond its 5-year timeframe a high priority should be given to institutional strengthening and capacity building, and to the training and education of various target groups.

### ***Funding***

Financial resources are crucial for implementation of the Seabirds RAP and in the short and medium term it is likely that much of the funding will need to be sought from international donors. Although there is a high level of awareness of bird conservation needs in many potential international donor organisations, this awareness needs to be raised in many of the PERSGA member states. Thus, in the longer term the securing of funding for seabird conservation and management activities should be aided by some of the proposed awareness activities.

However, there is also an urgent need to build the capacity of many PERSGA countries to develop project proposals for efficient multi-sectoral conservation programmes. Development of practical fund raising mechanisms in PERSGA countries would allow governmental, non-governmental and community based organisations to access funding resources by identifying conservation problems, setting priorities and preparing related proposals for submission to

donors. Thus it is suggested that the following actions are taken to secure funding for this and other PERSGA RAPs

#### ***Securing funding for seabird conservation***

- i. Identify potential funding sources from bilateral and multilateral donor organisations, including government and inter-governmental organisations, such as ministries, endowment funds, national and international foundations, Global Environment Facility (Large, Medium and Small Grant Program), UNEP, UNDP, overseas aid agencies, non-profit organisations (WWF, IUCN, Ramsar), and private foundations. Co-funding sources should also be investigated, including the Asian Development Bank, the African Development Bank, European Union and World Bank.
- ii. Develop the capacity at a national and regional level to prepare proposals which secure sole or co-funding from government and inter-governmental programmes and non-government institutions.
- iii. Establish a network of environmental organisations concerned with the conservation of seabirds and biodiversity in the RSGA Region.
- iv. Publish a reference guide for fundraising which lists ideas for sponsorship and provides information on successful proposals and funding sources.
- v. Develop regional proposals for fundraising which address multi-sectoral and integrated conservation approaches.
- vi. Establish a trust fund for long-term administration of conservation and management actions.

#### ***Indicators of success***

It is suggested that internal reviews of the success of each Component in meeting its objectives, are conducted annually and an external independent assessment made after two years and again after the five year life of the RAP. It is important that all stakeholders, including NGOs and local groups, are involved in the evaluation process. To enable an objective review to be made the Steering Committee and member countries should agree a set of defined SMART (Specific, Measurable, Achievable, Realistic and Time-specific) performance indicators for each action. Data requirements to monitor implementation should also be identified and a standard format for analysis and reporting defined. General best practice principles for implementation of the RAP are given in Box 1.

**Box 1. General principles for successful implementation of the RAP (after DE FONTAUBERT et al. 1996; BENITEZ et al. 2000; PERSGA/GEF 2003b)**

1. Involve all stakeholders (from local communities to central government) in consultation and decision-making.
2. Ensure high levels of information-sharing and technology-transfer across all scales of implementation and among all participants.
3. Foster widespread education and awareness.
4. Strengthen institutions and implement appropriate legal instruments.
5. Develop flexible and adaptive management systems that respond quickly to changing circumstances and new information.
6. Address socio-economic issues behind resource use and environmental degradation.
7. Collect and evaluate relevant environmental and socio-economic data with a focus on obtaining answers to resource management questions.
8. Ensure adequate and sustained financing for all aspects of the RAP.
9. Ensure effective integration of all priority actions and targets within the RAP and with other relevant regional plans, such as the Coral Reefs RAP.
10. Maintain consistency of approach across all spatial scales of implementation - local and national actions should be consistent with regional and global actions and co-operation.

### **8.3 Component 1: Integrated Coastal Zone Management Planning for Seabirds**

#### ***Concerns and needs***

There is a high degree of connectedness among coastal and marine ecosystems. Effective conservation of breeding seabirds and other marine wildlife requires successful management of adjacent coastal development and use. Because most of the Region's seabirds breed and feed close to or on the coast they are particularly sensitive to changes in coastal land-use patterns and in many areas are threatened by poorly planned developments. For instance, important islands for nesting seabirds have been targeted for tourist development in the Region, especially in the northern Red Sea and more recently, in the south. Additionally, a growing number of shrimp farms are being sited in important shallow-water areas. Planning needs to take place within an ICZM programme that zones areas exclusively for specific forms of development and/or access.

Some nations in the Region, such as Saudi Arabia, Jordan and Egypt, have taken major steps towards managing their coastal zones with the implementation of ICZM plans and their integration into national development plans. With the assistance of PERSGA, other countries in the Region have also initiated the preparation of their national ICZM plans. However, even in those countries with more advanced ICZM planning, improvements can be made in co-ordination between ministries, defining jurisdictions, avoiding conflicting objectives and in execution of land-use plans.

#### ***Principal objective(s)***

To implement ICZM planning for the conservation of breeding seabirds and their associated breeding, feeding, roosting and wintering habitats and sites, in all PERSGA nations. This should be supported by appropriate legislation, land-use planning, participatory approaches, socio-economic and environmental impact assessment, monitoring and enforcement.

#### ***Actions and priorities***

- i. Ensure that all national ICZM strategies and plans take into account seabird conservation requirements and where necessary, restrict potentially damaging activities within or in the vicinity of important breeding sites and feeding habitats (\*\*)

- ii. Develop regional and national guidelines for incorporating seabird conservation requirements into ICZM (\*\*)
- iii. Ensure potential terrestrial and marine pollution sources are adequately identified and covered in ICZM and other local plans, paying particular attention to those located near seabird nesting sites (\*\*)
- iv. Develop key demonstration sites using best practice ICZM where seabird conservation is highlighted (\*\*)

### ***Implementation and comments***

Effective implementation of ICZM plans will reduce the incidence of inappropriate development decisions and provide an effective mechanism for sustainable long-term use of the coastal zone. The adoption of this planning and management process to support development decisions throughout the Region could significantly reduce unnecessary degradation of the coastal and marine environments and should be considered an important weapon in seabird conservation.

PERSGA is currently preparing guidelines for ICZM. It is important that these take account of the recommendations in this RAP and ensure that a precautionary approach is adopted towards any future development issues affecting seabirds and the coastal zone.

## **8.4 Component 2: Education, public awareness and community participation**

### ***Concerns and needs***

The raising of public and government awareness of the importance of the Region's breeding seabirds and of the threats they face is crucial to their long-term conservation. PERSGA has already taken important steps in raising general environmental awareness, through regular publication of a newsletter ('*Al Sanbouk*') and other materials, and through development and enhancement of regional and national communication networks. However, there seems to have been little directed specifically at seabirds and their conservation in the RSGA.

Specific groups will need to be targeted in a seabird public awareness campaign, the most important being fishermen, local planners, tourists and tour agencies, and the military. Most fishermen are probably not aware of the laws and regulations regarding seabird collection because it has been a traditional activity and their 'rights' have never been questioned. As the level of tourism increases in the important seabird areas the level of potential threat is also likely to increase and tourists should also be made aware of the sensitivity of certain areas.

There is an important need to encourage young ornithologists in the Region who will take on the future role of research, monitoring and conservation.

### ***Principal objective(s)***

To raise government and public awareness of the Region's seabirds and their conservation through the implementation of education and awareness programmes. These should be developed for dissemination through communication networks to decision-makers, the mass media, schools, universities and local communities.

### ***Actions and priorities***

- i. Produce, publish and disseminate general education and awareness materials on the importance of seabirds in the Region and the threats to them (\*\*\*)

- ii. Develop special awareness campaigns aimed at target groups, especially fishermen, the military and coastguards in each PERSGA country, and enlist support for the protection of nesting seabirds among fishing communities and at the highest level in the military and coastguard authorities (\*\*\*)
- iii. Develop strong links with key government departments for delivering important findings from research and monitoring to decision-makers (\*\*\*)
- iv. Develop strong links with the mass media for dissemination of major newsworthy items (\*\*\*)
- vii. For each country, identify and develop consultative processes with the key stakeholders with relevance to breeding seabirds (\*\*\*)
- viii. Develop a public awareness campaign on the effects of pollution on the terrestrial and marine environments, targeted at local decision-makers and planners, focused on areas around important seabird nesting sites (\*\*)
- ix. Increase awareness among stakeholders (fishermen, the military and developers) of the impact of introduced predators on islands with nesting seabirds, and suggest practical ways for avoiding new accidental introductions (\*\*)

### ***Implementation and comments***

There are a multitude of approaches to education and awareness raising, ranging from talks in remote coastal communities to the distribution of materials via the internet. Several of these methods are already employed routinely within the Region (see for example FLEMING 1996), notably by NCWCD at several sites in Saudi Arabia and by Egyptian Environmental Affairs Agency (EEAA) as an integral part of the management of the Ras Mohammed National Park in Egypt. These programmes could serve as models for improving education and raising awareness in the RSGA Region. The national seabird status reports suggested that environmental education centres should be established at Moucha Island in Djibouti, the Farasan Islands Protected Area in Saudi Arabia, on the Yemeni Red Sea islands and on the island of Socotra.

Groups developing publicity materials should liaise with regional and international groups that have experience in developing avian education campaigns, such as BirdLife International, regarding the development of public awareness materials and campaigns for the Region. Active participation by local communities around important conservation areas in the early design and operation phases of education and awareness campaigns is also likely to significantly increase the chances of success.

Scientists and educators involved with the seabird conservation projects should submit articles and information to PERSGA for inclusion into the newsletter, educational materials and web pages.

Public awareness programmes should stress the linkages between healthy ecosystems and the sustainability of fisheries resources. Those directed at fishermen should focus on persuading them to fish responsibly to ensure the long-term sustainability of the seabird populations as well as the fisheries in which they operate.

## **8.5 Component 3: Site and habitat protection and management**

### ***Concerns and needs***

As described in Section 5, many breeding sites and wider habitats important for seabirds are under particular threat in the Red Sea and Gulf of Aden. Sandy beaches and islands, rocky coasts, mangroves and seagrass beds all need protection and appropriate management. The value of protected areas for the conservation and sustainable utilisation of seabirds is well established, with economic benefits from MPAs including income generation and employment through well-managed bird tourism. Such tourism-based revenue from protected areas has proven to be a viable source of funding for seabird management and research in other parts of the world, such as some islands in the Seychelles. There is the potential for implementation of similar systems of ‘users-pay’ in the RSGA Region.

Over the past decade, most nations in the Region have taken important steps towards establishing MPAs, encompassing a wide variety of marine and coastal habitats and a RSGA Regional Network of Marine Protected Areas – Regional Master Plan has recently been published (PERSGA/GEF 2002).

While many of the existing MPAs in the Red Sea and Gulf of Aden do support significant populations of breeding seabirds, not all of the important sites are included, nor are all species adequately represented within these protected areas. Indeed, many IBAs important for nesting seabirds in the Region are not within officially protected areas at all (see Section 4.5). PERSGA/GEF (2003a) identify 14 sites (MPAs and IBAs) that should be considered priorities for the seabird conservation (Figure 2).

Furthermore, many if not most of the Region’s MPAs are not adequately protected and do not offer sufficient safeguards to nesting seabirds. If resources are limited emphasis should be on institutional and capacity building, including resource mobilisation, to avoid designating more MPAs than can be managed.

Many seabird nesting sites can be conserved through site-specific measures such as the establishment and management of protected areas. However, seabird feeding areas are much larger and their protection is probably best addressed through habitat conservation measures. Unfortunately, there is a general lack of accurate and up-to-date information on the distribution and status of coastal habitats in the RSGA, particularly outside of protected areas and areas of key feeding habitats for seabirds have not been well identified.

Introduced predators are a particularly important threat to seabirds nesting on islands in the RSGA. However, there is little or no control over pets brought by fishermen, lighthouse keepers and military personnel to islands. There have been no recent systematic attempts to eradicate introduced predators from seabird nesting islands in the Red Sea or Gulf of Aden (the British administration formerly controlled rats and snakes on Mait Island off Somalia). Experience from other parts of the world, notably New Zealand, indicates that eradication campaigns on islands can be successful but are often costly and time consuming and need to be very thorough to succeed (VEITCH & BELL 1990; ASHMOLE et al. 1994).

The Region forms one of the major thoroughfares for international maritime traffic between Asia-Pacific and Europe, particularly for oil, most of which is transported by sea. The Region also has an abundance of reefs and narrow navigational channels and insufficient navigational markers. As described in Section 5, these factors place the Region’s seabirds at high risk from potential marine pollution.



**Figure 2. Priority sites for the conservation of nesting seabirds in the Red Sea and Gulf of Aden (from PERSGA/GEF 2003a)**

Several important measures to minimise the impact to coastal species and ecosystems from oil spills have already been implemented, including the development of national oil spill contingency plans by Egypt, Jordan, Saudi Arabia and Sudan, the oil spill equipment stockpile in Djibouti and progress towards the establishment of the Marine Emergency Mutual Aid Centre (MEMAC) in Egypt. PERSGA has also been promoting a number of measures to reduce navigation risks and maritime pollution through Component 2 of the SAP. It is vital that further actions are taken where necessary to ensure that all measures are fully implemented and effective in the long term.

***Principal objective(s)***

To ensure that all the major breeding sites and wider habitats (including sandy and coralline islands, islets, rocky coasts, seagrass shallows, coastal lagoons and mangroves) used by seabirds in the Region are adequately protected and their ecological functions maintained and, where necessary, restored.

### *Actions and priorities*

- i. Review the current effectiveness of protection and management at existing MPAs important for breeding seabirds and, where necessary, enhance these to ensure adequate protection of seabird populations (\*\*\*)
- ii. Designate and establish all IBAs important for breeding seabirds as MPAs (Annex 4) within the context of developing integrated regional and national MPA networks (\*\*\*)
- iii. Ensure that Environmental Impact Assessments (EIAs) are mandatory for developments such as hotels, roads, airports, ports, shrimp farms and industrial developments, where they may impact on MPAs and IBAs, whether directly (through land-take) or indirectly (for example, by disturbance or pollution) (\*\*\*)
- iv. Develop a management plan for all MPAs important for breeding seabirds, and regional and national guidelines for assessment of MPA management effectiveness in conserving breeding seabirds (\*\*\*)
- v. Establish Site Support Groups (see below) that monitor seabird populations, habitat condition and threats in all seabird IBAs (\*\*\*)
- vi. Assist in developing or improving performance of existing demonstration MPA sites, identified in the SAP and Coral Reef RAP, using best management practice, paying particular attention to seabird conservation measures (\*\*)
- vii. Support the regional network of MPA managers and researchers promoting regular communication and information-sharing (\*\*)
- viii. Draft regional/national guidelines, as appropriate, for achieving sustainable sources of funding for important seabird areas (\*\*)
- ix. Produce regional and national guidelines for treating seabird conservation issues within EIAs (\*\*)
- x. Support implementation of Port State Control throughout the Region (\*\*)
- xi. Contribute to the development of the Regional Navigation Risk Assessment and Management Plan (\*\*)
- xii. Support the development and implementation of regional and sub-regional vessel traffic systems with special emphasis on avoiding areas important to breeding seabirds. Additionally, upgrade existing marine navigation aids, particularly in the vicinity of sensitive areas important for nesting, feeding and roosting seabirds (\*\*)
- xiii. Develop, upgrade and implement local, national and regional pollution contingency plans and oil spill response capacities, and ensure their adequacy for the protection of seabirds (\*\*)
- xiv. Explore alternative sources of building materials and fuel for communities living near mangrove areas (\*)
- xv. Control grazing access to mangrove areas and set aside selected mangrove areas for complete protection (\*)
- xvi. Develop 'no-fishing' zones and, where necessary, closed fishing seasons during spawning periods to protect important reproductive fish stocks, in and around MPAs and IBAs important for nesting seabirds, particularly in areas of spawning aggregations (\*)
- xvii. Increase the enforcement of fishery regulations to reduce and if possible eliminate illegal trawling in shallow water areas, particularly over seagrass beds (\*)

### ***Implementation and comments***

There is a high degree of overlap between the recommended actions listed above and those relating to protected area and wider habitat management given in the PERSGA Regional Master Plan for MPAs (PERSGA/GEF 2002) and the other RAPs. Full implementation of these plans would also promote conservation of the Region's seabirds.

The establishment of Site Support Groups, as developed by BirdLife International for IBAs in Africa, can be an efficient and practical tool for involving local communities and stakeholders in the conservation of important sites. They may also produce effective linkages and synergies with each other, with the local administration and with external agencies. Key activities of Site Support Groups are:

- To raise awareness in local communities of the importance of the wise use of natural resources and of IBAs for the conservation of biodiversity
- To monitor the status of key species and habitats in their sites and the human activities occurring and to report illegal or destructive activities to the relevant authorities
- To start environmentally-friendly projects, clearly linked to conservation, that will help communities generate some income (for example, eco-tourism)
- To work with environmental NGOs and government agencies to rehabilitate degraded habitats, for example, by litter removal
- To provide a link to the local communities for negotiations and interventions at site level.

It is also important that a mechanism for assessing the effectiveness of MPA management, giving special regard to managing breeding seabirds, be developed for the Region.

The IUCN World Commission on Protected Areas (WCPA) has established a 'Management Effectiveness Steering Committee' to develop a system for verifying or assessing management effectiveness. This will include ongoing management of existing MPAs and the siting and design of new MPAs. As part of their work a document entitled "*Evaluating Effectiveness: A Framework for Assessing the Management of Protected Areas*" has been produced (HOCKINGS et al. 2000). A brief list of the general principles for assessment of MPA effectiveness is given in Appendix 8 of the RAP for Coral Reefs (PERSGA/GEF 2003b) and guidelines on developing management plans for MPAs in the Red Sea and Gulf of Aden are given in the Regional Master Plan for MPAs (PERSGA/GEF 2002). The BirdLife International Partnership has produced 'Guidelines for IBA Site Action Planning' as part of the development of the IBA programme for Africa (BIRDLIFE INTERNATIONAL 2001).

Restoration of degraded key habitats and sites should initially focus on IBAs and on areas required by the highest priority species. Regular clean up efforts should be made along key stretches of coast and at key seabird breeding sites, funded by oil and tanker companies using the Red Sea/Gulf of Suez route.

## **8.6 Component 4: Regulation of human exploitation**

### ***Concerns and needs***

Although levels of egg collecting and chick harvesting have not been quantified, they are believed to have a major impact on the RSGA seabird populations. Studies in other parts of the world have shown that uncontrolled harvesting of seabird eggs can quickly lead to local extinctions and threaten the survival of a species (BURGER & GOCHFELD 1994). Consequently,

protection of nesting seabird sites from human activities needs to be increased and made effective.

However, given the long established tradition of collecting seabird eggs (and to a lesser extent, chicks) by the Region's artisanal fishermen, it is necessary to take broader social, cultural and economic considerations into account when designing conservation measures. Moreover, the SAP for the Red Sea and Gulf of Aden states that, "Wherever possible, it [*the Action Plan for a key group such as seabirds*] should build on traditional beliefs and conservation practices". Successful models for the sustainable harvesting of seabird eggs that take account of the economic and cultural importance of harvesting to local fishing communities have been developed in other parts of the world (BLANCHARD 1994) and may be appropriate for some species and at some sites in the Region.

#### ***Principal objective(s)***

To reduce to sustainable levels the collection of seabird eggs and harvesting of chicks, while preserving the traditional rights and cultures of key stakeholders.

#### ***Actions and priorities***

- i. Establish the feasibility of introducing sustainable harvesting of seabird eggs for common and non-declining species (\*)
- ii. If appropriate, according to the results of Action (i), develop guidelines for sustainable harvesting in consultation with key stakeholders and introduce a pilot scheme at a suitable site in collaboration with local fishing communities and other stakeholders (\*)

#### ***Implementation and comments***

The development and execution of a sustainable model for seabird egg collection in the Region would require more extensive seabird population assessment and monitoring than currently takes place. It would also require an improved understanding of the population biology and ecology of the target species.

Radical new initiatives and solutions to the current poor enforcement at seabird nesting sites may be needed and could include the hiring and training of former 'poachers' as law enforcement officers.

The success of the actions recommended above would be enhanced by a public awareness and rural development programme to improve local food supply and diet, reducing the need for seabird eggs as a supplementary food.

### **8.7 Component 5: Research and monitoring**

#### ***Concerns and needs***

Effective seabird conservation needs accurate information on the status, distribution and biology of each species gathered at regular intervals, in order to develop species protection measures for ICZM plans, MPAs and other planning exercises, and for assessment of the effectiveness of conservation management itself. Seabirds are important bio-indicators of the health of the marine environment, as they are predators at the top of the food chain. Sampling of eggs, feathers or tissues can allow monitoring of the levels of organochlorines, heavy metals and pollutants in the marine environment. Seabird monitoring could include examination of the

levels of oil and plastic pollution at nest sites and give an indication of general environmental pollution. In addition, monitoring seabird populations, diets and breeding success can indicate the state and health of the fisheries in the Region.

Currently there is insufficient accurate data available on the seabirds of the RSGA and much of the information that does exist was collected outside of the breeding season or more than 10 years ago (PERSGA/GEF 2003a).

Most countries in the Region have yet to initiate seabird research. There are no systematic seabird monitoring projects and very few species-specific studies in the Region. There are major differences in logistic capacities between nations in relation to levels of finance, human capacity and expertise, equipment, and so on. This has meant that some parts of the Region have been reasonably well surveyed for breeding seabirds, for example, Egypt and Saudi Arabia, while others, notably Somalia and Sudan, have not.

Effective lobbying for conservation at government and inter-governmental levels benefits from the capacity to make realistic comparisons of the various financial costs and benefits that are attached to different courses of action. Analyses of the various economic values of seabirds, such as ecotourism, and costs of conservation, such as establishing protected areas, have yet to be properly attempted in the Region but are badly needed, especially since most governments rely on economic valuations in prioritising development options.

Since seabirds are not viewed as a priority by institutions in the Region, funding for seabird surveys generally comes from international and regional organisations. No effort has been made to attract financial sponsorship from wealthy organisations, such as oil companies. At present PERSGA is carrying out baseline habitat assessment studies in the Region, but further funding is needed to establish long-term research, monitoring and conservation activities.

Information on the extent and intensity of commercial trawling, illegal fishing, involvement of foreign vessels, and artisanal fishing in the RSGA is poor and the effect of fishing on the Region's seabirds is not well understood.

### ***Principal objective(s)***

To identify the status, distribution and ecological requirements of the Region's seabirds, to quantify threats to these and to establish national and regional monitoring schemes in relation to set habitat and species population targets.

### ***Actions and priorities***

- i. Initiate research into the key aspects of seabird biology and ecology of the high-priority and poorly-known species (including Jouanin's Petrel, Persian Shearwater, Socotra Cormorant and White-eyed Gull) concentrating on areas of highest importance for management and conservation (\*\*\*)
- ii. Define habitat condition, species population, breeding success and survival rate targets for each seabird species (\*\*\*)
- iii. Conduct additional surveys in the Region to ensure that all key nesting, feeding and roosting sites for seabirds are identified, concentrating on those species, countries and areas where data are particularly lacking (\*\*)

- iv. Develop a regional system of monitoring environmental threats to seabirds, which should include routine sampling of toxin levels in eggs, discarded feathers and dead birds (\*\*)
- v. Establish a regionally coordinated, comprehensive, long-term monitoring programme at key seabird sites in the Region (IBAs) and establish national and regional reporting guidelines, to assess attainment of conservation targets and to identify sites where threats to seabirds are operating (\*\*)
- vi. Assess the status, distribution and condition of the major coastal habitats in the Red Sea and Gulf of Aden at both national and regional levels and identify degraded areas of former importance for the highest priority seabirds, that may be potentially restored. Assess the feasibility and costs of doing so (\*\*)
- vii. Determine and monitor the extent, intensity and impact of egg and chick collecting by fishermen and military personnel throughout the Red Sea and Gulf of Aden (\*\*)
- viii. Undertake research into, followed by development of, methods to reduce and ideally eliminate mammalian predators from islands with significant breeding seabird colonies, targeted at mongoose, dogs, feral cats and rats (\*\*)
- ix. Investigate the impact of fisheries practices (introduction of new technology, fisheries conservation methods, use of nets and lines) on seabird populations in the Region (\*)
- x. Investigate the feasibility of Indian House Crow control methods in the countries and areas where this species is established and determine the likelihood of success of intensive trapping on islands with breeding seabirds where the species occurs (\*)

### ***Implementation and comments***

Consistent application of standard methods will provide scientifically robust information on seabird status for local and national management agencies and will facilitate regional and global comparisons.

Standardised methods should be made as simple and inexpensive as practicable, to be equally applicable in all nations and tailored to the conditions of the Region. PERSGA has already developed Standardised Survey Methods for the census of breeding seabirds (see Section 3.1), which could form the basis for monitoring programme methods.

It is important that the results of research, surveys and monitoring of seabirds are made readily available to key decision-makers and to the general public.

In the longer term, a region-wide, seabird ringing programme should also be established, although it is recognised that this will require extensive training programmes, since there is a shortage of qualified bird ringers in member countries.

Oil, tourism and fisheries industry bodies should be approached to establish a fund for seabird monitoring and research in the Red Sea and Gulf of Aden.

A regional survey of shrimp and cuttlefish stocks and research into the impacts of trawl fishing on the environment are currently underway.

## **8.8 Component 6: Strengthening legislation**

### ***Concerns and needs***

Although most of the PERSGA countries have national legislation protecting the marine environment and many are signatories to international conventions concerning the conservation of seabirds, the legislation is not adequately regulated or effectively enforced. This is probably because seabirds are not viewed as a priority for management (PERSGA/GEF 2003a).

### ***Principal objective(s)***

To increase the legal protection afforded to seabirds, their breeding sites and their wider habitats in the RSGA Region.

### ***Actions and priorities***

- i. Where identified as a requirement by PERSGA (see below), further develop policy and legislation frameworks to ensure effective protection of MPAs against damaging activities (\*\*\*)
- ii. Encourage all countries in the Region to join the CBD, CMS and other relevant global and regional biodiversity conservation and marine pollution conventions (\*\*)
- iii. Where required, further develop relevant national legislation defining safe shipping routes and passages, and if necessary, require compulsory pilotage of vessels carrying high risk cargo through critical seabird areas (\*\*)
- iv. Examine the feasibility of establishing 'Particularly Sensitive Sea Areas' around the key seabird nesting sites considered to be most at risk from ship groundings and oil spills, with the assistance of the International Maritime Organization (\*\*)
- v. Ensure ratification of relevant marine pollution conventions, such as the Basel Convention and MARPOL, by all of the Region's nations, including Eritrea (\*\*)
- vi. Review and update the conservation status of the Region's seabirds in each country's Red List/Red Data Book (\*\*)
- vii. Incorporate international 'best use' guidelines on environmental management, public participation in EIAs, conservation management, monitoring and research into national policy and legislation (\*\*)
- viii. Strengthen national and local legislation and enforcement relating to pollution from terrestrial sources (\*)
- ix. Introduce a ban, where appropriate, on the introduction or keeping of pets on offshore islands in the Red Sea, particularly through the military and lighthouse operating authorities (\*)

### ***Implementation and comments***

PERSGA have appointed a team to review environmental legislation in each country and to provide a national report for each member state summarising its responsibilities under, and implementation of, international environmental agreements. This will be used to identify requirements for further legislation to address gaps in implementation of international agreements. The actions listed above should therefore focus on addressing such gaps.

## **8.9 Component 7: Institutional capacity building and training**

### ***Concerns and needs***

Most nations in the Region have recently started to activate marine environmental protection as an economic security measure. However, responsibility for the marine environment is usually shared between different departments, which often creates a conflict of interests.

Most of the work carried out on seabirds in the Region (largely research) has been undertaken by international bodies or researchers. Non-governmental groups (NGOs) have not played a major role in seabird conservation and they need to be encouraged to participate.

There are a limited number of conservation experts in the Region and many of these are expatriates. The shortfall of qualified, experienced people is particularly acute at the senior management level. There is a clear need to increase manpower and strengthen skills to improve assessment, planning and management of coastal and marine environments.

### ***Principal objective(s)***

To increase the capacity of national organisations, both governmental and non-governmental, to protect breeding seabirds by the enforcement of legislation, monitoring work and research.

### ***Actions and priorities***

- i. Develop capacities for day-to-day management, monitoring, surveillance and enforcement at MPAs, through training courses (\*\*\*)
- ii. Develop coordinated national inter-departmental policy and responses to seabird and marine conservation issues (\*\*)
- iii. Build national capacities for seabird population monitoring, research and management, in collaboration with international and national NGOs, universities and other research organisations, through training, exchange visits and other model projects (\*\*)
- iv. Encourage closer coordination among existing seabird projects and programmes in the Region to share experiences, methodology and manpower (\*\*)
- v. Assist in building national capacities for surveillance and enforcement of shipping regulations, ensuring legislation has appropriate punitive clauses for legislative breaches affecting seabirds and particularly nesting sites (\*\*)

### ***Implementation and comments***

Significant strengthening of existing institutional arrangements is required for successful implementation of the priority actions identified in this RAP. Given the trans-boundary character of many environmental threats, co-operation and coordination among the various sectors will need to be substantially strengthened at both the regional and national levels.

Consideration should be given to establishing a 'pool' of regional specialists who could be sourced to undertake work in the different PERSGA countries. The 'twinning' of MPAs and IBAs in countries with fewer resources, such as Somalia, with wealthier ones, such as Saudi Arabia should also be considered.

Where possible, training courses should be designed and operated by groups within the Region with assistance from international experts if required. Training courses should include seabird sanctuary management, surveying and monitoring, ranger enforcement duties, and conflict resolution.

## 9. REFERENCES

- AL-SAGHIER, O. 2000. Complete Report on the Bird Fauna of Socotra Archipelago. BirdLife International and Environmental Protection Council, UNDP/GEF/UNOPS and Socotra Biodiversity Project.
- AL-SAGHIER, O. 2002a. Survey of the Breeding Seabirds in Red Sea of the Republic of Yemen. PERSGA, Jeddah.
- AL-SAGHIER, O. 2002b. Consultant Report on Ornithological Survey in Protected Areas of Socotra. Ministry of Tourism and Environment, UNDP/GEF/UNOPS and Socotra Biodiversity Project.
- AL-SAGHIER, O., ALSUHAIBANY, A. & SYMENS, P. 1999. The status of breeding seabirds at Socotra archipelago. PERSGA, Jeddah.
- AL-SAGHIER, O., PORTER, R. & ASPINAL, S. Breeding birds population estimates of Socotra Archipelago. Unpublished report.
- ASHMOLE, N.P., ASHMOLE, M.J. & SIMMONS, K.E.L. 1994. Seabird conservation and feral cats on Ascension Island, South Atlantic. In: Seabirds on Islands – Threats, Case Studies and Action Plans. (Nettleship, D.N., Burger, J. & Gochfield, M. eds). *BirdLife Conservation Series*. No. 1. pp. 94-121.
- ATKINSON, I.A.E. 1985. The spread of commensal species of *Rattus* to oceanic islands and their effects on island avifaunas. *ICBP Technical Publication* No. 3. pp. 35-84.
- AWAD, H. 1995. *Oil pollution in the Red Sea: A state of the art assessment*. PERSGA/IOC/UNEP Workshop on Oceanographic Inputs into Coastal Zone Management in the Red Sea and Gulf of Aden. 12 Oct. 1995, Jeddah. IOC Workshop Report No. 126. IOC/UNESCO.
- BAHA EL-DIN, M. 2001. Pilot Management Plan for Giftun Island and Environs: Birds, Reptiles and Mammals Component. USAID-EEAA Red Sea Protectorate Programme.
- BAHA EL DIN, M., BAHA EL DIN, S. & SHOBRAK, M. 2003. Status of Breeding Seabirds in the Egyptian Red Sea. Report to PERSGA. PERSGA, Jeddah. 30 pp.
- BENITEZ, M., DURON, G., ERAZO, M., GAMMAGE, S. & MACHADO, M. 2000. A platform for action: Sustainable management of mangroves, Gulf of Fonseca, Central America. *InterCoast Network International Newsletter of Coastal Management* **37**: 16-17.
- BIRDLIFE INTERNATIONAL. 2000. *Threatened Birds of the World*. Lynx edicions Barcelona, and BirdLife International, Cambridge, UK.
- BIRDLIFE INTERNATIONAL. 2001. Guidelines for IBA Site Action Planning: A summary. African NGO-Government Partnerships for Sustainable Biodiversity Action Project. (RAF/97/G31/A/1G/31). BirdLife International, Cambridge, UK.
- BIRDLIFE INTERNATIONAL. 2003. BirdLife's Online World Bird Database: the site for bird conservation. Version 2.0. Cambridge, UK.
- BLANCHARD, K.A. 1994. Culture and seabirds conservation: The North Shore of the Gulf of St. Lawrence, Canada. In: Seabirds on Islands – Threats, Case Studies and Action Plans. (Nettleship, D.N., Burger, J. & Gochfield, M. eds). *BirdLife Conservation Series* No. 1. pp. 294-310.
- BURGER, J. & GOCHFIELD, G. 1994. Predation and effects of humans on island-nesting seabirds. In: Seabirds on Islands – Threats, Case Studies and Action Plans. (Nettleship, D.N., Burger, J. & Gochfield, M. eds). *BirdLife Conservation Series* No. 1. pp. 39-67.

- CHILD, G., & GRAINGER, J. 1990. *A System Plan for Protected Areas for Wildlife Conservation and Sustainable Rural Development in Saudi Arabia*. National Commission for Wildlife Conservation and Development, Riyadh, & World Conservation Union, Gland, Switzerland. 335 pp.
- DE FONTAUBERT, A.C., DOWNES, D.R. & AGARDI, T.S. 1996. Biodiversity in the Seas Implementing the Convention on Biological Diversity in Marine and Coastal Habitats. *IUCN Environmental Policy and Law Paper No. 32*. A Marine Conservation and Development Report. IUCN Gland, Switzerland and Cambridge, UK. 82 pp.
- DELANY, S. & SCOTT, D. 2002 *Waterbird Population Estimates*. Wetlands International, Wageningen. 226 pp.
- EC & MFW. 1995. Coastal Marine Habitat Survey. Phase I. Preliminary habitat classification and an assessment of coast's resources, users and impacts. Report MEP-YE-067. MacAlister Elliot & Partners Ltd., Lymington, UK and Ministry of Fish Wealth, Yemen.
- EVANS, M.I. 1994. (ed). Important Bird Areas in the Middle East. *BirdLife Conservation Series No. 2*. BirdLife International, Cambridge. 410 pp.
- EVANS, P.G.H. 1987. Seabirds of the Red Sea. In: *Key Environment: Red Sea*. (Edwards, A.J. & Head, S.M. eds). Pergamon Press, Oxford. pp. 315-338.
- FISHER, P.R. 2001. Ecology and behaviour of Osprey *Pandion haliaetus* of Farasan Islands, Red Sea, Saudi Arabia. The Manchester Metropolitan University, England. PhD thesis.
- FISHPOOL, L.D.C. & EVANS, M.I. (eds). 2001. Important Bird Areas in Africa and associated islands: Priority sites for conservation. *BirdLife Conservation Series No. 11*. Pisces Publication and BirdLife International, Newbury and Cambridge, UK.
- FLEMING, R.M. 1996. The Role of Education in Marine Sanctuary Management. In: *A Marine Wildlife Sanctuary for the Arabian Gulf. Environmental Research and Conservation following the 1991 Gulf War Oil Spill*. (Krupp, F., Abuzinada, A. & Nader, I. eds). pp. 496-502. Forschungsinstitut Senckenberg, Frankfurt and National Commission for Wildlife Conservation and Development, Riyadh.
- FREEDMAN, B. 1989. *Environmental Ecology, the Impacts of Pollution and Other Stresses on Ecosystem Structure and Function*. Academic Press, San Diego.
- GALLAGHER, M.D., SCOTT, D.A., ORMOND, R.F., CONNOR, R.J. & JENNINGS, M.C. 1984. The distribution and conservation of seabirds breeding on coasts and islands of Iran and Arabia. *ICBP Technical Publication No. 2*: 421-456.
- GREAT BARRIER REEF MARINE PARK AUTHORITY. 1997. Guidelines for managing visitation to seabird breeding islands. Great Barrier Reef Marine Park Authority. 92 pp.
- GRIEVE, A. & MILLINGTON, L. 1999. The Breeding Birds of the Northern Red Sea Islands, Egypt. Unpublished report.
- HOATH, R., RUSSELL, D., KHALIL, R. & KHALIL, D. 1997. The birds of the islands at the mouth of the Gulf of Suez, Egyptian Red Sea. *Sandgrouse* **19**: 22-29.
- HOCKINGS, M., STOLTON, S. & DUDLEY, N. 2000. *Evaluating Effectiveness: A Framework for Assessing the Management of Protected Areas*. IUCN, Gland, Switzerland and Cambridge, UK. 121 pp.
- JENNINGS, M.C. 2003. ABBA Survey 31: Bir Ali and Red Sea islands, Yemen. *Phoenix* **19**: 11-20.
- KHALIL, A.S.M. 2003. Regional Action Plan for the Conservation of Mangroves in the Red Sea and Gulf of Aden. PERSGA, Jeddah.
- MINISTRY OF PLANNING. 1995. *Achievements of Development Plans: 1972-1994*. Ministry of Planning Press. Kingdom of Saudi Arabia.

- MOORS, P.J. & ATKINSON, I.A.E. 1984. Predation on seabirds by introduced animals, and factors affecting its severity. *ICBP Technical Publication* No. 2. pp. 667-690.
- NEWTON, S.F. & AL SUHAIBANY, A.H. 1996. Distribution and abundance of summer breeding seabirds in the Saudi Arabian Red Sea 1996. Unpublished report, NCWCD, Riyadh. 56 pp.
- NISBET, I.C.T. 1994. Effects of pollution on marine birds. In: Seabirds on islands; threats, case studies and action plans. (Nettleship, D.N., Burger, J. & Gochfield, M. eds). *BirdLife Conservation Series* No. 1. pp. 8-25.
- PERSGA/GEF. 1998. Strategic Action Programme for the Red Sea and Gulf of Aden. Volume 1. Main Report. PERSGA, Jeddah and the World Bank, Washington. 90 pp.
- PERSGA/GEF. 2001. Strategic Action Programme for the Red Sea and Gulf of Aden. Volume 2. Country Reports. PERSGA, Jeddah and the World Bank, Washington. 205 pp.
- PERSGA/GEF. 2002. The Red Sea and Gulf of Aden Regional Network of Marine Protected Areas: Regional Master Plan. PERSGA Technical Series No. 1. PERSGA, Jeddah. 86 pp.
- PERSGA/GEF. 2003a. Status of Breeding Seabirds in the Red Sea and Gulf of Aden. PERSGA Technical Series No. 8. PERSGA, Jeddah. 70 pp.
- PERSGA/GEF. 2003b. Regional Action Plan for the Conservation of Coral Reefs in the Red Sea and Gulf of Aden. PERSGA Technical Series No. 3. PERSGA, Jeddah. 50 pp.
- PILCHER, N. 2003. Coral Reefs in the Red Sea and the Gulf of Aden. Surveys 1990 to 2000: Summary and Recommendations (PERSGA/GEF). PERSGA Technical Series No. 7. PERSGA, Jeddah. 148 pp.
- PORTER, R.F., CHRISTENSEN, S. & SCHIERMAKER-HANSEN, P. 1996. *Field Guide to Birds of the Middle East*. T & A D Poyser, London. 460 pp.
- PRIMACK, R.B. 1993. *Essentials of Conservation Biology*. Boston University Press, USA.
- RUSHDIE, A.I., BA-ESSA, A.A. & BABAGI, A. 1991. Preliminary investigations of oil pollution along the Red Sea coast of Yemen. In: *Proceedings of the Seminar on the Status of the Environment in the Republic of Yemen, June 1991*. pp. 175-186. Environment Protection Council, Sana'a Yemen.
- SHOBRAK, M. 2001. The breeding birds survey in the south west of Saudi Arabia. Unpublished report (in Arabic). NCWCD, Riyadh.
- SHOBRAK, M. 2002. Status of the breeding seabirds at the Gulf of Aden of Somalia. Unpublished report. PERSGA, Jeddah. 18 pp.
- SHOBRAK, M., RAYALEH, H. & AOULED, A. 2002a. The status of the breeding seabirds in Djibouti. Unpublished report. PERSGA, Jeddah.
- SHOBRAK, M., EL-JACK, A.O. & ASH SHEIKH, F.H. 2002b. The status of the breeding seabirds in Sudan. Unpublished report. PERSGA, Jeddah.
- SHOBRAK, M., ALSUHAIBANY, A. & NEWTON, S. 2002c. Status of breeding seabirds on the Red Sea of Saudi Arabia. Unpublished report. PERSGA, Jeddah.
- SIMMONS, D.J. 1994. The White-cheeked tern (*Sterna repressa*) in the Red Sea, Saudi Arabia. Manchester Metropolitan University, England. MSc Dissertation.
- SNOW, D.W. & PERRINS, C.M. 1998. *The Birds of the Western Palearctic. Concise Edition. Volume 1: Non-Passerines*. Oxford University Press. 1008 pp.
- SWEET, G. 1994. Nest site selection and breeding biology of the Bridled Tern *Sterna anaethetus*, on the Farasan Islands, Red Sea, Saudi Arabia. Manchester Metropolitan University, England. MSc. Dissertation.

- TALEB, N.M.A. 2002. The discovery of a breeding colony of Jouanin's Petrel *Bulweria fallax* on Socotra, Yemen. *Sandgrouse* **24** (2): 105-108.
- TATWANY, H., GOLDSPIK, C.R., MORGAN, D.H., SIMMONS, D. & SWEET, G. 1995. The distribution and status of seabirds on the Farasan Islands, Red Sea, Saudi Arabia, with a note on the possible effects of egg predation. NCWCD & Manchester Metropolitan University.
- TUCKER, G.M. & EVANS, M.I. 1997. Habitats for birds in Europe: a conservation strategy for the wider environment. *BirdLife Conservation Series* No. 6. BirdLife International, Cambridge, U.K. 464 pp.
- UNEP/PERSGA. 1997. Assessment of Land-based Sources and Activities Affecting the Marine Environment in the Red Sea and Gulf of Aden. UNEP Regional Seas Reports and Studies No. 166. 62 pp.
- VEITCH, C.R. & BELL, B.D. 1990. Eradication of introduced animals from the islands of New Zealand. In: Ecological restoration of New Zealand islands. (Towns, D.R., Daugherty, C.H. & Atkinson, L.A.E. eds). *Conservation Science Publication* No. 2. pp. 137-146. Department of Conservation, Wellington.
- WELCH, G.R. & WELCH, H.J. 1998. A report on Birds of Djibouti and Bankoulé Palm *Livistona carinensis*. *Biodiversity Report* No. 4. Privately published.

### **Recommended additional reading**

- ANDREWS, I.J. 1995. *The Birds of the Hashemite Kingdom of Jordan*. Midlothian EH21. Scotland.
- ASH, J.S. 1980. Common and Lesser Noddy *Anous stolidus* and *A. tenuirostris* in Somalia. *Scopus* **4**: 6-9.
- ASH, J.S. & KARANI, A.A. 1981. Roseate and Sooty terns *Sterna dougallii* and *S. fuscata* breeding on islets in southern Somalia. *Scopus* **5**: 22-7.
- ASH, J.S. & MISKELL, J.E. 1998. *Birds of Somalia*. Sussex, Pica Press.
- BAHA EL DIN, S. 1998. Towards Establishing a Network Plan for Protected Areas in Egypt. Nature Conservation Section. EEAA.
- BAILEY, R.S. 1966. The seabirds of the southern coast of Arabia. *Ibis* **108**: 224-264.
- BAILEY, R.S. 1968. The pelagic distribution of seabirds in the western Indian Ocean. *Ibis* **110**: 493-519.
- BAILEY, R.S. 1971. Seabird observations off Somalia. *Ibis* **113**: 29-41.
- BROOKS, D.J., EVANS, M.I., MARTINS, R.P. & PORTER, R.F. 1987. The status of birds in North Yemen and the records of OSME Expedition in autumn 1985. *Sandgrouse* **9**: 4-66.
- BROWN, L.H., URBAN, E.K. & NEWMAN, K. 1982. *The Birds of Africa*. Volume 1. Academic Press, London.
- COOPER, J., WILLIAMS, A.J. & BRITTON, P.L. 1984. Distribution, population size and conservation of seabirds in Afrotropical Region. *ICBP Technical Publication* No. 2. pp. 403-419.
- DEVANTIER, L. & PILCHER, N. 2000. The status of coral reefs in Saudi Arabia. PERSGA, Jeddah. 45 pp.
- FRAZIER, J.G., SALAS, S.S. & SALEH, M.A. 1984. Ornithological observations along the Egyptian Red Sea coast, spring 1982: with notes on migratory and breeding species. *Courser* **1**: 17-27.

- GESAMP (Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection). 1990. The State of the Marine Environment. UNEP Regional Seas Reports and Studies No. 115. UNEP, Nairobi.
- GOODMAN, S.M. & MEININGER, P.L. 1989. *The Birds of Egypt*. Oxford University Press, Oxford.
- GOODMAN, S.M. & STORER, R.W. 1987. The seabirds of the Egyptian Red Sea and adjacent water, with notes on selected Ciconiiformes. *Gerfaut* **77** (2): 109-145.
- JENNINGS, M.C., HEATHCOTE, P.C., PARR, D. & BAHA EL DIN, S.M. 1985. Ornithological Survey of the Ras Dib area and the islands at the mouth of the Gulf of Suez, Egypt. Oil Pollution Research Unit, Pembroke, UK. 118 pp.
- JOUANIN, C. 1957. Les Procellariidés mélaniques signalés en Mer d'Oman. *L'Oiseau et Review Française Ornithologique* **27**: 12-27.
- KIRWAN, G.M., MARTINS, R.P., MORTON, K.M. & SHOWLER, D.A. 1996. The status of birds in Socotra and 'Abd Al Kuri and the records of the OSME survey in spring 1993. *Sandgrouse* **17**: 83-101.
- LAURENT, A. 1987. Reserve Naturelle de Djibouti/Waramous. Avant projet. (Unpublished report).
- LAURENT, A. 1990. Catalogue commenté de oiseaux de Djibouti. Office National du Tourisme et de l'Artisanat, Djibouti.
- LAURENT, A. 1993. Nature et développement: le cas de Djibouti. Office National du Tourisme et de l'Artisanat/Commission des Communautés Européenes, Djibouti.
- MEADOWS, B. 1993. Islets near Yanbu al Bahar, Red Sea. *Phoenix* **10**: 7-8.
- MEINERTZHAGEN, R. 1924. Birds at Egyptian lighthouses. *Ibis*, Ser. 11, 6: 643.
- MEINERTZHAGEN, R. 1930. *Nicoll's birds of Egypt*. Hugh Rees, London.
- MOORE, R.J. & BALZAROTTI, M.A. 1983. Observations of sea birds nesting on islands of the Sudanese Red Sea. *Bulletin of the British Ornithological Club* **103**: 65-71.
- NIKOLAUS, G. 1987. Distribution atlas of Sudan's birds with notes on habitat and status. *Bonner Zoologische Monographien* **25**: 1-322.
- NIKOLAUS, G. 1989. Status of the Crab Plover *Dromas ardeola* in the Sudan. *Scopus* **12** (3-4): 87.
- NORTH, M.E.W. 1946. Mait Island – a bird rock in the Gulf of Aden. *Ibis* **88**: 478-501.
- ORMOND, R., SHEPHERD, A.D. & PRICE, A. 1984. Sea and Shore birds. In: *Saudi Arabian Marine Conservation Programme*. Report No. 4. University of York, UK. pp. 124-140.
- OSTROWSKI, S. 2001a. Report of a visit to Umm al Qamari protected area, February 2001. Unpublished report. NWRC, Taif, Saudi Arabia. 10 pp.
- OSTROWSKI, S. 2001b. Report of a visit to Umm al Qamari protected area, May 2001. Unpublished Report. NWRC, Taif, Saudi Arabia. 19 pp.
- OSTROWSKI, S. 2002. Report of a visit to Umm al Qamari protected area, 25 May 2002. Unpublished Report. NWRC, Taif, Saudi Arabia. 17 pp.
- PORTER, R.F. & AL-SAGHIER, O. 1998. The birds of some of Yemen's Red Sea islands. *Sandgrouse* **20** (1): 66-67.
- PORTER, R.F. & STONE, F. 1996. An introduction to Socotra and its birds. *Sandgrouse* **17**: 73-80.
- RIPLEY, R.F. & BOND, G.M. 1966. The Birds of Socotra and 'Abd al-Kuri. *Smithsonian Miscellaneous Collection* **151**, No. 7.

- ROSE, P.M. & SCOTT, D.A. 1994. Waterfowl Population Estimates. International Waterfowl and Wetlands Research Bureau, Slimbridge. (IWRB Special Publication 29).
- STAGG, A.J. 1984a. A note on the breeding birds of Kutambil Island on the Red Sea coast of Saudi Arabia. *Fauna of Saudi Arabia* **6**: 546-548.
- SYMENS, P. 1988. Birds of the Farasan Islands. NWRC Quarterly Report Summer 1988. pp. 50-66.
- SYMENS, P. & ALSUHAIBANY, A. 1996. Status of the breeding populations of tern (Sternidae) along the eastern coast of Saudi Arabia following the 1991 Gulf War. In: *A Marine Wildlife Sanctuary for the Arabian Gulf. Environmental Research and Conservation Following the 1991 Gulf War Oil Spill*. (Krupp, F., Abuzinada, A.H. & Nader, I.A. eds). pp. 404-420. NCWCD, Riyadh and Senckenberg Research Institute, Frankfurt. 512 pp.
- SYMENS, P. & EVANS, M.I. 1993. Impact of Gulf War oil spills on Saudi Arabian breeding population of terns *Sterna* in the Arabian Gulf, 1991. *Sandgrouse* **15**: 18-36.
- SYMENS, P., KINZELBACH, R., SUHAIBANI, A. & WERNER, M. 1993. A review of the status, distribution and conservation of Socotra cormorant, *Phalacrocorax nigrogularis*. *Zoology in the Middle East* **8**: 17-30.
- SYMENS, P. & WERNER, M. 1996. Status of Socotra cormorant in the Arabian Gulf after the 1991 Gulf War oil spill, with an outline of standardized census technique. In: *A Marine Wildlife Sanctuary for the Arabian Gulf. Environmental Research and Conservation Following the 1991 Gulf War Oil Spill*. (Krupp, F., Abuzinada, A.H. & Nader, I.A. eds). pp. 390-403. NCWCD, Riyadh and Senckenberg Research Institute, Frankfurt. 512 pp.
- VINE, P. 1985. *The Red Sea*. IMMEL Publishing, London. 128 pp.
- WALKER, F.J. 1981. Notes on the birds of Dhofar, Oman. *Sandgrouse* **2**: 56-85.

## ANNEXES

### Annex 1. Number of breeding pairs of true seabirds recorded in different PERSGA countries where known (from PERSGA/GEF 2003a)

**Key:** B = Recorded breeding; NB = Non-breeding; V = Occasional visitor; B? = Possible breeding, confirmation required

Species	Estimated number of breeding pairs in different PERSGA countries						
	Djibouti	Egypt	Jordan	Saudi Arabia	Somalia	Sudan	Yemen
Jouanin's Petrel <i>Bulweria fallax</i>	-	-	-	V	B?	-	50+
Persian Shearwater <i>Puffinus persicus</i>	-	-	-	V	V	-	10,000
Red-billed Tropicbird <i>Phaethon aethereus indicus</i>	3-7	10	-	11-100	B	B?	520-700
Brown Booby <i>Sula leucogaster plotus</i>	100-150	85	NB	2,000	B	B	13,230
Masked Booby <i>Sula dactylatra melanops</i>	-	-	-	V	100-240	-	800-1,150
Socotra Cormorant <i>Phalacrocorax nigrogularis</i>	-	-	-	V	V	-	B
Sooty Gull <i>Larus hemprichii</i>	B	100+	NB	1,000-1,500	50-100	B	2,525+
White-eyed Gull <i>Larus leucophthalmus</i>	600-700	2,500	NB	>1,500	1,200-2,200	300-1,000	3,900+
Caspian Tern <i>Sterna caspia</i>	-	250-350	NB	100-200	NB	-	B
Swift Tern <i>Sterna bergii velox</i>	500-600	B	NB	2,000	<1,000	B	B
Lesser Crested Tern <i>Sterna bengalensis</i>	1,000 (1985)	1,500+	NB	2,000-4,000	B	3,000-5,000	5,000
White-cheeked Tern <i>Sterna repressa</i>	60-80	2,500+	NB	7,500	B	B	8,910+
Sooty Tern <i>Sterna fuscata</i>	-	-	-	V	B?	-	V
Bridled Tern <i>Sterna anaethetus</i>	530	1,200+	NB	60,000	100,000+	8,000	70,230
Little Tern <i>Sterna albifrons</i>	-	B?	V	NB	-	-	NB
Saunders's Little Tern <i>Sterna saundersi</i>	-	B	NB	B	B	B?	B
Brown Noddy <i>Anous stolidus</i>	5-10	-	-	7,500	10,000-20,000	B	3,940

**Note:** There are no documented records of breeding seabirds in Jordan, although it should be noted that survey information on the coast is old. Furthermore, there are some unconfirmed reports of breeding White-eyed Gull and Caspian Tern.

## Annex 2. Feeding and nesting habits of the 17 true seabirds that nest in the RSGA Region

Species	Main food items	Feeding habits	Feeding habitat	Nest site	Nesting habitat
Jouanin's Petrel <i>Bulweria fallax</i>	Poorly known, but probably mainly plankton such as fish eggs, ctenophores and polychaete worms	Flies close to waves, takes food from surface of sea	Open sea, where it remains for most of year; feeding areas poorly known.	Nests in small holes and crevices; nests colonially	Sea cliffs but may nest inland in Socotra Island Group (nesting habits poorly known)
Persian Shearwater <i>Puffinus persicus</i>	Fish, cephalopods, crustaceans	Pattering, surface-seizing and diving up to 20 seconds at a time	Open sea; gathers at upwelling off south-west Arabian Sea.	Burrows and crevices; colonial nester	Cliffs and slopes of oceanic islands and coral atolls
Red-billed Tropicbird <i>Phaethon aethereus indicus</i>	Chiefly fish and squid	Plunge dives vertically into water where it remains for only few seconds	Shallow waters, open sea	Rocky crevices, inaccessible to predators; gregarious when nesting	Uninhabited smaller islands, high cliffs
Brown Booby <i>Sula leucogaster plotu</i>	Mostly fish, squid and shrimp	Usually plunge dives obliquely into water from low height	Marine, sometimes pelagic but mostly coastal waters	Colonial nester	Rocky cliffs, slopes and flat ground, even sandy ground shaded by vegetation
Masked Booby <i>Sula dactylatra</i>	Fish, especially flying fish and cephalopods	Deep plunge diving sometimes from great height	Marine and pelagic, seldom near land outside breeding season	Colonial nester, forming mixed colonies with Brown Booby	Nests on rocky offshore islands near cliff edges, on vegetated flat ground or slopes, among boulders, on sand; breeds in more difficult upland sites on islands
Socotra Cormorant <i>Phalacrocorax nigrogularis</i>	Mostly fish	Surface dives in pursuit of prey but also plunge dives from height	Maritime and coastal water, frequently areas with cool upwelling of water during July-August monsoon	Among rocks; colonial nester	Jumbled rocky coral areas on islands, open sandy islands; in Socotra it breeds in rocky islets
Sooty Gull <i>Larus hemprichii</i>	Omnivorous, including fish, offal, predation on other seabird eggs and chicks	Scavenges at rubbish tips, harbours, commonly follows fishing boats or waits in harbour for offal; food piracy; picks small items from surface of water and plunge dives for small fish	Very commonly near man, for example, coastal areas near ports and towns, also along tideline and among mudflats	Lined scrape or depression on ground on coral or sand under bush, mangrove, etc.; solitary or colonial nester, usually among other species colonies, such as White-eyed Gull, terns and boobies	Coasts and inshore islands at or near sea-level
White-eyed Gull <i>Larus leucophthalmus</i>	Largely fish, crustaceans, molluscs, annelids and offal	Usually at sea, but will scavenge in harbours and domestic refuse; less associated with ports, fishermen and shipping than Sooty Gull	Coastal areas and islands	Narrow lined scrape on ground in open near shore; nests in loose colonies	Inshore islands and islets, on bare rocky surfaces, or sandy flats or exposed hard-pan
Caspian Tern <i>Sterna caspia</i>	Mainly fish, some invertebrates	Plunge dives, usually submerges completely	Coastal, lagoons, estuaries and lakes	Unlined shallow depression; generally breeds colonially, with solitary pairs often nesting with other colonial seabirds	Open ground, on sand, gravel, stony beaches, or flat rocks, usually on islands but also on lagoons and estuaries

Species	Main food items	Feeding habits	Feeding habitat	Nest site	Nesting habitat
Swift Tern <i>Sterna bergii velox</i>	Mainly fish	Plunge dives or takes food from surface	Coastal and marine, including lagoons and estuaries	Unlined shallow scrape on bare ground or among scattered bushes; nests individually or in small colonies	Sandy or rocky islands
Lesser Crested Tern <i>Sterna bengalensis</i>	Mainly fish, but also crustaceans	Plunge dives or takes food from surface	Lagoons, shallow and deep waters, mangroves; forages in surf but ranges well offshore	Shallow scrape on ground. Breeds colonially	Flat sandy upper beaches, especially on low-lying islands, among dwarf or stunted sand sparse vegetation, and on bare sand-spits, flat rocks or coral islands
White-cheeked Tern <i>Sterna repressa</i>	Chiefly small fish and invertebrates	Plunge dives or takes food from surface	Mostly coastal and inshore waters	Nest usually unlined, shallow scrape on flat ground; colonial nester	Sparsely vegetated open ground, such as sand dunes above high-water mark on beaches, sandy coral islands
Sooty Tern <i>Sterna fuscata</i>	Small fish, crustaceans, squid	Takes food from surface, plunge dives occasionally	Maritime, pelagic, avoiding coastal areas, coming to land only to breed	Scrape in flat bare soil, sand or short grass with little or no lining, usually under bush if available; nest colonially but usually away from other species	Nests on sandy, stony ground and among small scrubby vegetation on oceanic, offshore and inshore islands
Bridled Tern <i>Sterna anaethetus fuligula</i>	Mostly small fish, planktonic invertebrates, including crustaceans and molluscs	Feeds chiefly from surface, mainly by hovering and dipping-to-surface	Coastal, offshore	Shallow scrape usually unlined or eggs laid on bare rock; nests in small, usually loose breeding colonies	Islands, also mainland in some areas; nests in open, under bushes on sand and coral islets or bare rock
Little Tern <i>Sterna albifrons albifrons</i>	Small fish and invertebrates	Usually plunge dives	Coastal and inland waters	Shallow scrape sometimes lined; nests in sparse colonies	Nest in open on sandy beaches, sandbars and shingle beaches
Saunders's Little Tern <i>Sterna saundersi</i>	Mostly fish	Plunge dives or surface-dips	Shallow coastal waters, lagoons, harbours, estuaries, and occasionally inland	Nests in small colonies	Nest on bare sand or shingle up to 2 km inland
Brown Noddy <i>Anous stolidus</i>	Mostly fish	Forages over water picking up food from surface	Maritime, especially outside breeding season	In holes and under rocks; nests colonially	Nest on rocky islets and cliffs

**Main reference sources**

PORTER et al. (1996); SNOW & PERRINS, (1998); AL-SAGHIER et al. (1999); AL-SAGHIER (2002b); TALEB (2002)

### Annex 3. National and international conservation status of breeding seabird species in the RSGA Region

Species	Conservation status									
	IUCN	CMS App. I/II	AEWA Annex II	Djibouti	Egypt	Jordan	Saudi Arabia	Somalia	Sudan	Yemen
Jouanin's Petrel <i>Bulweria fallax</i>	LR/nt			-	-	-	No breeding confirmed	No breeding confirmed	Uncertain	Near-threatened
Persian Shearwater <i>Puffinus persicus</i>	LR/nt			Near-threatened	-	-	Near-threatened	Near-threatened	ID	Near-threatened
Red-billed Tropicbird <i>Phaethon aethereus indicus</i>	-			Scarce breeder, not threatened	ID	-	Rare breeder, not threatened	Uncertain	Uncertain	Scarce breeder, not threatened
Brown Booby <i>Sula leucogaster plotus</i>	-			Uncertain	Rare, threatened	-	Threatened	Declining, threatened	ID	Threatened
Masked Booby <i>Sula dactylatra melanops</i>	-			-	-	-	Non-breeder	Threatened	-	Threatened
Socotra Cormorant <i>Phalacrocorax nigrogularis</i>	VU	II	X	-	-	-	Vulnerable	Vulnerable	-	Vulnerable
Sooty Gull <i>Larus hemprichii</i>	-	II	X	Widespread, stable population	Scarce, not threatened	-	Widespread, evenly distributed, not threatened	Widespread	ID	Widespread, not threatened
White-eyed Gull <i>Larus leucophthalmus</i>	LR/nt	I/II	X	Near-threatened	Near-threatened	-	Near-threatened	Threatened	Near-threatened	Threatened
Caspian Tern <i>Sterna caspia</i>	-	II*	X	-	Stable breeding population	-	Small breeding population, widespread, not threatened	Non-breeder	-	Scarce breeder, threatened
Swift Tern <i>Sterna bergii velox</i>	-	II**	X	Uncertain	Small breeding population	-	Not threatened	Resident breeder, uncertain status	Breeder in small numbers, not threatened	-
Lesser Crested Tern <i>Sterna bengalensis</i>	-	II**	X	Small breeding population, status uncertain	Common, not threatened	-	Widespread, not threatened	Uncertain	Abundant	Threatened
White-cheeked Tern <i>Sterna repressa</i>	-	II	X	Uncertain, small numbers	Breeder and migrant, common	-	Widespread, not threatened	Uncertain	Abundant	Widespread, not threatened
Sooty Tern <i>Sterna fuscata</i>	-			-	-	-	-	Uncertain	-	-
Bridled Tern <i>Sterna anaethetus</i>	-			Uncertain, breeds in one island	Common, not threatened	-	Increasing number, not threatened	Abundant, not threatened	Abundant	
Little Tern <i>Sterna albifrons albifrons</i>	-	II	X	-	Scarce breeder and on migration	-	-	-	-	

Species	Conservation status									
	IUCN	CMS App. I/II	AEWA Annex II	Djibouti	Egypt	Jordan	Saudi Arabia	Somalia	Sudan	Yemen
Saunders's Little Tern <i>Sterna saundersi</i>	VU	I/II	X	-	No confirmed breeding	-	Rare breeder, threatened	ID	Rare, little known	Rare breeder, threatened
Brown Noddy <i>Anous stolidus</i>	-			Uncertain	-	-	Abundant, stable	Abundant, not threatened	Uncertain	Not threatened

National threat status is based on a species listing in Red List of each PERSGA country and the national seabird status reports; NA = no national assessment of threat status has been undertaken; ID = insufficient data

IUCN categories. VU = Vulnerable; LR/nt = (Lower Risk) Near-threatened; LR/lc = (Lower Risk) Less concern (BIRDLIFE INTERNATIONAL 2000). CMS App. I/II – Listed on Convention on Migratory Species Appendix I or II. \* - listed for West Eurasian and African populations. \*\* - listed for African and South West Asian populations. AEWA Annex II – Listed on Annex II of the African-Eurasian Migratory Waterbird Agreement

**Annex 4. Summary of Important Bird Areas in the Red Sea and Gulf of Aden of special importance to breeding seabirds from (EVANS 1994 and FISHPOOL & EVANS 2001)**

IBA	IBA number	Coords	Area (ha)	Protected status	Breeding seabird species	Reason for inclusion*	Comments
<b>Djibouti</b>							
Isles des Sept Frères	DJ004	12°28'N 43°23'E	c.4,000	Unprotected (proposed)	<i>Sterna bengalensis</i> , <i>Sterna bergii</i> , <i>Sula leucogaster</i>	<i>Sterna bengalensis</i> , <i>Sterna bergii</i>	
<b>Egypt</b>							
Hurghada Archipelago	EG015	27°28'N 33°49'E	150,000	Partially protected (National Park)	<i>Sula leucogaster</i> , <i>Phaethon aethereus</i> , <i>Larus hemprichii</i> , <i>Sterna caspia</i> , <i>Sterna bergii</i> , <i>Sterna bengalensis</i> , <i>Sterna anaethetus</i> , <i>Sterna repressa</i>	<i>Larus leucophthalmus</i> <i>Sterna repressa</i> <i>Sterna caspia</i> <i>Sterna bengalensis</i>	Largest breeding population of the white-eyed gull in the world, with 3,000 breeding pairs
Tiran Island	EG016	27°56'N 34°33'E	3,100	National Park	<i>Larus leucophthalmus</i> , <i>Sterna repressa</i> , <i>Sterna bengalensis</i> and <i>Sterna caspia</i>	<i>Larus leucophthalmus</i>	Part of Ras Mohammed National Park
Wadi Gimal (Jimal) Island	EG017	24°40'N 35°10'E	200	National Park	<i>Phaethon aethereus</i> , <i>Larus hemprichii</i> , <i>Larus leucophthalmus</i> and <i>Sterna caspia</i>	<i>Larus leucophthalmus</i>	
Qulân Islands	EG018	24°22'N 35°23'E	300	National Park	<i>Phaethon aethereus</i> , <i>Larus hemprichii</i> , <i>Larus leucophthalmus</i> and <i>Sterna caspia</i>	<i>Larus leucophthalmus</i>	
Zabargad Island	EG019	23°37'N 36°12'E	450	National Park	<i>Sula leucogaster</i> , <i>Larus leucophthalmus</i> , <i>Sterna caspia</i> , <i>Sterna bengalensis</i> , <i>Sterna anaethetus</i> , <i>Sterna repressa</i>	<i>Larus leucophthalmus</i>	
Siyal Islands	EG020	22°47'N 36°11'E	200	National Park	<i>Larus leucophthalmus</i> , <i>Larus hemprichii</i> , <i>Sterna caspia</i> , <i>Sterna repressa</i>	<i>Larus leucophthalmus</i>	
Rawabel Islands	EG021	22°25'N 36°32'E	<100	National Park	<i>Larus leucophthalmus</i> , <i>Larus hemprichii</i> and <i>Sterna caspia</i>	<i>Larus leucophthalmus</i>	
<b>Saudi Arabia</b>							
Al Wajh Bank	SA011	25°35'N 36°45'E	c.288,000	Unprotected	<i>Larus leucophthalmus</i>	<i>Larus leucophthalmus</i> <i>Larus hemprichii</i> <i>Sterna repressa</i>	
Madinat Yanbu al-Sinaiyah	SA016	23°56'N 38°14'E	c.700	Biological Reserve	<i>Sterna repressa</i> , <i>Sterna.saundersi</i>	<i>Sterna repressa</i> <i>Sterna saundersi</i>	
Qishran Bay	SA025	20°15'N 40°10'E	c.400,000	Unprotected	<i>Sterna anaethetus</i>		Not selected on basis of seabird populations breeding at site
Umm al-Qamari	SA026	18°59'N 41°06'E	c.14.7	Special Nature Reserve	<i>Larus leucophthalmus</i> , <i>Larus hemprichii</i>	<i>Larus leucophthalmus</i> <i>Larus hemprichii</i>	

IBA	IBA number	Coords	Area (ha)	Protected status	Breeding seabird species	Reason for inclusion*	Comments
Farasan Islands	SA038	16°45'N 42°00'E	c.620,000	Special Nature Reserve, Natural Reserve, Resources use Reserve and Controlled Hunting Reserve	<i>Larus leucophthalmus</i> , <i>Sula leucogaster</i> , <i>Larus hemprichii</i> , <i>Sterna repressa</i> , <i>Sterna anaethetus</i> , <i>Sterna bergii</i> , <i>Sterna saundersi</i> , <i>Anous stolidus</i>	<i>Larus leucophthalmus</i> <i>Sula leucogaster</i> <i>Larus hemprichii</i> <i>Sterna repressa</i> <i>Sterna anaethetus</i> <i>Sterna saundersi</i> <i>Anous stolidus</i>	
<b>Somalia</b>							
Jasiira Ceebaad (Aibat island) and Jasiira Sacaada Diin (Saad a-din Island)	SO001	11°28'N 43°28'E	c.690	Unprotected (proposed)	<i>Sula leucogaster</i> , <i>Larus hemprichii</i> , <i>Larus leucophthalmus</i> , <i>Sterna repressa</i> , <i>Sterna bergii</i> and <i>Sterna bengalensis</i> , <i>Sterna anaethetus</i>	<i>Larus leucophthalmus</i> <i>Larus leucophthalmus</i> <i>Sterna anaethetus</i>	Over 100,000 breeding pairs of <i>Sterna anaethetus</i> recorded
Jasiira Maydh (Mait Island)	SO002	11°14'N 47°15'E	45	Unprotected (proposed)	<i>Phaethon aethereus</i> , <i>Sula dactylatra</i> , <i>Sterna fuscata</i> , <i>Sterna anaethetus</i> and <i>Anous stolidus</i>	<i>Anous stolidus</i>	20,000 breeding pairs
<b>Sudan</b>							
Mukawwar Island and Dugonab Bay	SD002	20°50'N 37°17'E	c.12,000	Unprotected	<i>Sterna bengalensis</i> , <i>Sterna repressa</i> , <i>Sterna anaethetus</i> , <i>Larus hemprichii</i> , <i>Larus leucophthalmus</i>	<i>Larus leucophthalmus</i> <i>Larus leucophthalmus</i> <i>Sterna bengalensis</i>	
Suakin Archipelago	SD004	18°50'N 38°00'E	150,000	Unprotected	<i>Sterna bergii</i> , <i>Sterna bengalensis</i> , <i>Sterna repressa</i> , <i>Sterna anaethetus</i> , <i>Anous stolidus</i> , <i>Sula leucogaster</i> , <i>Larus hemprichii</i>	<i>Sterna bergii</i> <i>Sterna bengalensis</i>	
<b>Yemen</b>							
Midi - Luhayyah	YE001	16° 00'N 42° 50' E	30,000	Unprotected	<i>Larus leucophthalmus</i>	<i>Larus leucophthalmus</i> , <i>Sterna repressa</i>	
Islands north of Al-Hudaydah (Hodeidah)	YE004	15°40'N 42°30'E	c.5,000	Unprotected	<i>Larus leucophthalmus</i> , <i>Phaethon aethereus</i> , <i>Sula leucogaster</i> , <i>Sterna bengalensis</i> , <i>Sterna repressa</i> , <i>Larus hemprichii</i>	<i>Larus leucophthalmus</i> <i>Phaethon aethereus</i> <i>Sula leucogaster</i> , <i>Sterna bengalensis</i> <i>Sterna repressa</i> <i>Larus hemprichii</i>	
Bahr Ibn Abbas-Ra's Isa	YE007	15°20'N 42°50'E	c.35,000	Unprotected	<i>Larus leucophthalmus</i> , <i>Sterna repressa</i> , <i>Larus hemprichii</i>	<i>Larus leucophthalmus</i> <i>Sterna caspia</i> <i>Sterna repressa</i> <i>Larus hemprichii</i>	Many non-breeding seabirds occur as summer visitors
Al-'Urj	YE010	15° 05' N 42° 55' E	1,500	Unprotected	<i>Numenius phaeopus</i> , <i>Sterna saundersi</i>	<i>Sterna saundersi</i>	
Jaza'ir Al-Zubayr	YE012	15° 00' N 42° 04' E	c.3,300	Unprotected	<i>Larus leucophthalmus</i> , <i>Phaethon aethereus</i> , <i>Sula leucogaster</i> , <i>Sula dactylatra</i> , <i>Sterna bengalensis</i> , <i>Sterna repressa</i> , <i>Puffinus persicus</i> , <i>Larus hemprichii</i>	<i>Larus leucophthalmus</i> <i>Puffinus persicus</i> <i>Larus hemprichii</i>	

IBA	IBA number	Coords	Area (ha)	Protected status	Breeding seabird species	Reason for inclusion*	Comments
Nukhaylah-Ghulayfiqah	YE015	14° 30' N 43° 00' E	9,000	Unprotected	<i>Larus leucophthalmus</i>	<i>Sterna repressa</i>	
Al-Fazzah	YE016	14° 08' N 43° 07' E	3,500	Unprotected	<i>Larus leucophthalmus</i>	<i>Sterna repressa</i>	
Jaza'ir al-Hanish	YE019	13° 52' N 42° 45' E	28,000	Unprotected	<i>Larus leucophthalmus</i> , <i>Larus hemprichii</i> , <i>Sula leucogaster</i>	<i>Larus leucophthalmus</i> <i>Puffinus persicus</i> <i>Larus hemprichii</i> , <i>Sterna repressa</i>	
Qishen Beach	YE027	15° 26' N 51° 45' E	c.100	Unprotected	<i>Phalacrocorax nigrogularis</i> , <i>Larus hemprichii</i>	<i>Phalacrocorax nigrogularis</i>	
Islands off Bir Ali	YE030	13° 50' N 48° 20' E	c.300	Unprotected	<i>Phalacrocorax nigrogularis</i> , <i>Larus hemprichii</i>	<i>Phalacrocorax nigrogularis</i>	
Aden	YE033	12° 45' N 45° 04' E	c.10,000	Unprotected	<i>Larus leucophthalmus</i>	<i>Larus hemprichii</i>	
Qalansiya Lagoon, Socotra	YE035	12° 42' N 53° 30' E	c.100	Protected	<i>Larus hemprichii</i>	<i>Larus hemprichii</i>	
Sabuniya and Ka'l Fir'awn, Socotra	YE054	12° 33' N 52° 42' E	c.10	Protected	<i>Phalacrocorax nigrogularis</i> , <i>Sula leucogaster</i> , <i>Sula dactylatra</i>	<i>Sula dactylatra</i> <i>Bulweria fallax</i>	
Al-Mukha – Al-Khawkhah	YE057	13° 35' N 43° 17' E	c.7,000	Unprotected	<i>Larus leucophthalmus</i>	<i>Larus leucophthalmus</i> <i>Puffinus persicus</i> <i>Larus hemprichii</i> <i>Sterna repressa</i> <i>Sterna saundersi</i>	

\* Note: IBAs are identified on the basis of four strict criteria. These are that the site contains species of global conservation concern as follows: (A1) The site regularly holds significant numbers of a globally threatened species, or other species of global conservation concern; (A2) The site is known or thought to hold a significant component of the restricted-range species whose breeding distributions define an Endemic Bird Area (EBA) or Secondary Area (SA); (A3) The site is known or thought to hold a significant component of the group of species whose distributions are largely or wholly confined to one biome; (A4i) The site is known or thought to hold, on a regular basis, >1% of a biogeographic population of a congregatory waterbird species; (A4ii) The site is known or thought to hold, on a regular basis >1% of the global population of a congregatory seabird or terrestrial species; (A4iii) The site is known or thought to hold, on a regular basis, >20,000 waterbirds or >10,000 pairs of seabirds of one or more species, and (A4iv) The site is known or thought to exceed thresholds set for migratory species at bottleneck sites. See EVANS (1994) and FISHPOOL AND EVANS (2001) for more details.



**Figure 3. Map of Important Bird Areas given in Annex 4**

## **Annex 5. Major global and regional conventions and agreements relevant to seabird conservation in the RSGA Region**

### **Global agreements**

#### **1. Convention on Biological Diversity (CBD)**

The Convention on Biological Diversity, adopted in 1992, entered into force in 1993. It currently has 180 parties. The convention has three objectives:

- the conservation of biological diversity
- the sustainable use of its components
- the fair and equitable sharing of the benefits arising out of the use of genetic resources.

Covering almost every aspect of conservation and sustainable use, the CBD has become an important framework for conservation-related activities on regional and national levels.

For the conservation of biodiversity the primary approach is *in situ* conservation. Parties have to identify components of biodiversity important for their conservation and sustainable use (Article 7); *inter alia* ecosystems and habitats with large numbers of threatened species or required by migratory species (Annex I). Sites supporting significant populations of breeding seabirds such as IBAs should become part of these inventories, which should be included in National Biodiversity Strategies and Action Plans (NBSAPs) required from the parties by article 6a.

Parties are requested to establish a system of protected areas or areas where special measures need to be taken to conserve biodiversity (Article 8a). The CBD also asks for the prevention of introduction and the control and eradication of alien species which threaten ecosystems, habitats and species (Article 8h) and urges parties to set up an effective system of environmental impact assessment. Impact assessment more generally is called for in Article 14.

The CBD supports the integrated approach of conservation and sustainable use and asks parties to protect and encourage customary use of biological resources in accordance with traditional cultural practices that are compatible with conservation requirements (Article 10c).

#### **2. Ramsar Convention: Convention on Wetlands of International Importance especially as Waterfowl Habitat**

The Ramsar Convention is an inter-governmental treaty that provides the framework for international co-operation for the conservation and wise use of wetlands. It was adopted in 1971 in Ramsar, Iran and entered into force in 1975. Wetlands, as defined by the Convention, include lagoons and similar shallow water coastal areas that may be extremely important for breeding seabirds.

The main undertakings accepted by the 122 contracting parties are to:

- designate suitable wetlands within their territory for inclusion in a List of Wetlands of International Importance (the Ramsar List) (Article 2.1)
- formulate and implement their planning so as to promote the conservation of the wetlands included in the list, and as far as possible, the wise use of wetlands in their territory (Article 3.1)
- promote the conservation of wetlands and waterfowl by establishing nature reserves on wetlands whether they are included in the List or not, and provide adequately for their wardening (Article 4.1).

Each contracting party must designate at least one site for inclusion in the list at the time it joins the convention (Article 2.4). Specific criteria have been drawn up under the convention to aid the identification of sites of international importance.

Also of relevance is the Montreux Record, a register of selected wetlands on the Ramsar List where changes in ecological character have occurred, are occurring or are likely to occur as a result of technological developments, pollution or other human interference. This is a very important tool because it identifies specific sites for international conservation attention.

There are as yet no designated sites important for seabirds in the RSGA Region. However, the Ramsar Convention Secretariat recognizes that seabird colonies are under-represented in the list of Ramsar Sites and is trying to encourage the designation of more seabird sites.

### **3. Convention concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention, WHC)**

The aim of the World Heritage Convention, which was adopted in 1972 and entered into force in 1975, is the protection of natural and cultural areas of outstanding universal value. Such sites and monuments are considered to be of such exceptional value that their protection is the concern of all mankind, and thus international co-operation in order to contribute effectively to their protection is sought. Each site nominated by the parties for inclusion in the World Heritage List is assessed by the World Heritage Committee, which in the case of natural sites, is advised by experts from the World Conservation Union (IUCN). The convention imposes a legal duty on each of the 164 parties to do its utmost to protect designated sites. Each party is required to contribute to the World Heritage Fund that may be used to secure the protection of World Heritage Sites.

### **4. Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention, CMS)**

The Bonn Convention, which was adopted in 1979 in Bonn, Germany and entered into force in 1983, has 74 parties. The fundamental objective of the convention is to protect migratory species (birds, mammals, fish and invertebrates) in recognition of the fact that protection is needed throughout every part of their migratory ranges, and that this requires international co-operation and action. If a party to the convention is a range state of a migratory species listed in Appendix I or II, it accepts an obligation to provide strict protection for species in Appendix I and to endeavour to conclude agreements with other range states for the conservation and management of species in Appendix II. Appendix I species are in danger of extinction throughout all, or a major part, of their range, and Appendix II species are those which would benefit from international co-operation in their conservation and management.

For Appendix I species, parties that are range states, are obliged to endeavour, amongst other things, to: conserve and, where feasible and appropriate, restore those habitats of the species, which are of importance in removing the species from danger of extinction (Article III 4a).

Two agreements within the CMS are of relevance to breeding seabirds and seabird sites in the Red Sea and Gulf of Aden: the African-Eurasian Migratory Waterbird Agreement and the recent Agreement on the Conservation of Albatrosses and Petrels.

#### **i. Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA)**

AEWA entered into force in 1999 and can be signed and ratified by a range state, irrespective of whether the state has signed or ratified the Convention (for example, Sudan). AEWA aims to create the legal basis for a concerted conservation policy among the range states of all migratory waterbird species and populations, which migrate in the African-Eurasian flyway, irrespective of their current conservation status. The agreement, which currently has 29 parties and is accompanied by a comprehensive action plan, provides a framework for conservation action, monitoring, research and management of several globally important bird-migration systems. As such, it has close links to the IBA programme and to the Ramsar Convention.

#### **ii. Agreement on the Conservation of Albatrosses and Petrels (ACAP)**

This agreement was adopted in February 2001 and has been signed by, seven countries to date (Brazil, France, the UK, Chile, Peru, Australia and New Zealand).

This agreement, which includes an Action Plan, describes a number of conservation measures to be implemented by signatories to the proposed Agreement, including research and monitoring, reduction of incidental mortality in fisheries, eradication of non-native species at breeding sites, reduction of disturbance and habitat loss, and reducing pollution. ACAP is centred on the southern oceans, where most of the endangered species occur but it was purposefully left open to the possibility that one day it will become the tool for the conservation of large seabirds worldwide. Consequently, it may be of relevance to the conservation of Jouanin's Petrel (*Bulweria fallax*) and Persian Shearwater (*Puffinus persicus*) in the future.

#### **5. Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)**

CITES, which was adopted in 1973 and entered into force in 1975, has 154 parties. It aims to protect threatened species from detrimental effects of international trade. Trade in species of Annex I is banned, due to their status as being threatened by extinction, while those of Annex II are only allowed to enter the international trade under specific controlled circumstances. Many Middle Eastern and African species that are heavily traded, internationally or domestically, are not included in the CITES annexes, this being particularly true for passerines.

#### **6. United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (UNCCD)**

The Convention to Combat Desertification was adopted in 1994 and entered into force in 1996. It has 175 parties. Its objective is to combat desertification and mitigate the effects of drought. The convention's main tools are regional and national action programmes. The convention pursues a bottom-up approach, which asks for effective participation at the local, national and regional levels of non-governmental organisations and local populations in policy planning and decision-making (Article 10).

Article 8 of the regional implementation annex for Africa demands that national action programmes include measures to conserve natural resources by ensuring integrated and sustainable management of natural resources, and training with regard to public awareness and environmental education campaigns.

#### **7. United Nations Framework Convention on Climate Change (UNFCCC)**

The Climate Change Convention was adopted in 1992 and entered into force in 1994. With 182 parties, it is one of the most widely accepted global conventions. Its ultimate objective is to stabilise greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change. The Kyoto Protocol to the UNFCCC, adopted in 1997, but not yet in force, contains individual emission limitations and reductions commitments for a range of developed-country parties.

Climate change is one of the most serious long-term threats to ecosystems and although hard to predict, could affect many seabird nesting sites in the Red Sea and Gulf of Aden both directly, if sea levels rise, and indirectly through changes in ecosystem composition. Thus, any advocacy for seabird conservation in the Red Sea and Gulf of Aden cannot afford to neglect the implementation of the UNFCCC.

#### **8. UNESCO's Man and the Biosphere Programme**

The United Nations Educational, Scientific and Cultural Organization's (UNESCO) Programme on Man and the Biosphere (MAB) aims to develop a basis, within the natural and social sciences, for the sustainable use and conservation of biological diversity, and for the improvement of the relationship between people and their environment globally.

The MAB Programme has a major physical presence globally through the World Network of Biosphere Reserves. Biosphere Reserves are areas of terrestrial and coastal ecosystems promoting solutions to reconcile the conservation of biodiversity with its sustainable use. They are nominated by national governments and are internationally recognised. There are currently no Biosphere Reserves relevant to breeding seabirds in the Red Sea and Gulf of Aden Region.

## **9. UNCLOS - The UN Convention on the Law of the Sea**

UNCLOS, which entered into force in 1994, covers virtually all areas of ocean management and use and is considered by many to be the "constitution for the oceans". More specifically member states are obliged to preserve rare or fragile ecosystems, the habitats of threatened [fish] species and other forms of marine life and to implement various anti-pollution measures.

## **10. International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (MARPOL 73/78)**

The Convention entered in force in 1983 and aims to prevent and control deliberate discharges and accidental spills from shipping into the marine environment, including oil, noxious liquid substances in bulk, harmful substances carried by sea in packaged forms, in freight containers, portable tanks, or by road and rail wagons, as well as sewage and garbage. It is the principal international agreement for regulating unnecessary discharges of oil from ships.

## **11. Basel Convention**

The Basel Convention was originally designed to address uncontrolled movement and dumping of hazardous wastes, including incidents of illegal dumping in developing nations by companies from developed countries. Key objectives are to minimise the generation of hazardous wastes in terms of quantity and hazardousness, dispose of them as close to the source of generation as possible and reduce the movement of hazardous wastes.

These objectives are addressed through a framework for controlling the international movements of hazardous wastes, Environmentally Sound Management (ESM) and through a control system, based on prior written notification. Each party to the Convention is required to report information on the generation and movement of hazardous wastes.

The Secretariat, based in Geneva and administered by UNEP, assists countries (as well as interested organisations, private companies, industry associations and other stakeholders) to manage or dispose of their wastes in an environmentally sound way. It also co-operates with national authorities in developing national legislation, setting up inventories of hazardous wastes, strengthening national institutions, assessing the hazardous waste management situation, and preparing hazardous waste management plans and policy tools. In addition, it provides legal and technical advice to countries in order to solve specific problems related to the control and management of hazardous wastes. In the case of an emergency, such as a hazardous waste spill, the Secretariat co-operates with parties and relevant international organisations to provide rapid assistance in the form of expertise and equipment.

## **Regional Agreements**

### **12. Regional Convention for the Conservation of the Red Sea and Gulf of Aden Environment (Jeddah Convention)**

The Jeddah Convention of 1982 provides an important basis for environmental co-operation in the RSGA Region. It was the result of a Regional Intergovernmental Conference, supported by ALECSO and the United Nations Environment Programme. The Convention seeks to ensure conservation of the environment of the Red Sea and Gulf of Aden by the promotion, on a regional basis, of environmental protection and natural resources management in the marine and coastal areas of the Region.

The Conference produced two additional instruments:

- Action Plan for the Conservation of the Marine Environment and Coastal Areas in the Red Sea and Gulf of Aden
- The Protocol Concerning Regional Co-operation in Combating Pollution by Oil and Other Harmful Substances in Cases of Emergency.

Djibouti, Egypt, Jordan, Saudi Arabia, Somalia, Sudan and Yemen are parties to the Jeddah Convention.

### **13. The Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Eastern African Region (Nairobi Convention)**

The Nairobi Convention was adopted in 1985 and came into force in 1996. It aims to protect and manage the marine environment and coastal areas of the Eastern African region. The contracting parties commit themselves to take all appropriate measures to prevent, reduce and combat pollution of the Convention area, particularly pollution from ships, dumping, land-based sources, exploration and exploitation of the sea bed, and airborne pollution. They also agree to protect and preserve rare or fragile ecosystems as well as the habitat of depleted, threatened or endangered species and other marine life in specially protected areas. Furthermore, parties agree to co-operate in dealing with pollution emergencies in the Convention area. An Action Plan has been developed.

There are also two associated protocols both adopted in 1985:

- Protocol concerning Co-operation in Combating Marine Pollution in Cases of Emergency in the Eastern African Region
- Protocol concerning Protected Areas and Wild Fauna and Flora in the Eastern African Region.

A protocol on pollution from land-based sources is under development, as is a project in co-operation between the Nairobi Convention, the UNEP GPA and the Global Environment Facility (GEF).

The Eastern African Regional Coordinating Unit (EAF/RCU), based in the Seychelles, coordinates the work within the Convention. The Secretariat administers the Action Plan of the Convention, including the protocols.

### **14. The African Convention on the Conservation of Nature and Natural Resources**

The African Convention on the Conservation of Nature and Natural Resources is the main instrument that focuses on wildlife conservation in Africa and was adopted in 1968.

Article VII of the Convention calls upon contracting party States to formulate effective legislation on the hunting and capture of wild animals in order to ensure that the issuance of permits is properly regulated and emphasises the need to enact legislation that would ban unauthorised methods of hunting. It prohibits the use of fire, vehicles and hunting at night. Article VII also prohibits the abandonment of carcasses of wild animals by hunters.

The provisions of Article VIII generally require parties to provide special protection to species either threatened, or likely to become threatened, with extinction and to the habitats necessary for their survival.

Article XI urges parties to reconcile the provisions of hunting laws with the customary rights of local communities close to areas set aside for wildlife conservation and management.

### **15. Intergovernmental Authority on Development**

The Intergovernmental Authority on Drought and Development (IGADD) was formed in 1986 with a very narrow mandate focused on issues of drought and desertification. The IGADD was revitalised in the mid 1990s into a fully-fledged regional, political, economic, development, trade and security entity and a new name (IGAD) and charter were adopted in 1996. Three priority areas of co-operation were identified including food, security and environmental protection.

The IGAD covers Djibouti, Ethiopia, Kenya, Somalia, the Sudan and Uganda

## Annex 6. Impacts of recommended actions on threats

Predicted impacts of actions over five year course of RAP if fully implemented: Blank = no expected impact. 1 = Low, i.e. may reduce impact slightly; 2 = Moderate, i.e. likely to significantly reduce impact; 3 = High, i.e. likely to substantially alleviate threat.

Priorities are based on quartiles scores. Priority 1 actions are those with scores in the upper third quartile of combined scores (i.e. above 18), Priority 2 actions are those with scores at or between the 1st and 3rd quartiles, and Priority 3 actions are those with scores below the 1st quartile (i.e. less than 6).

		Disturbance	Exploitation	Habitat degradation	Marine pollution	Terrestrial pollution	Fishing*	Predators	Global warming	Combined score	Priority
	<b>Weighted Threat Score / 100 (see Table 3) *Fishing is ascribed a score of 1</b>	<b>2.36</b>	<b>2.12</b>	<b>2.31</b>	<b>2.83</b>	<b>0.59</b>	<b>1</b>	<b>2.24</b>	<b>0.59</b>		
	<b>Component 1: Integrated coastal zone management planning for seabirds (ICZM)</b>										
1	Ensure that all national ICZM strategies and plans take into account seabird conservation requirements			2	2	2			1	12	2
2	Develop regional and national guidelines for incorporating seabird conservation requirements into ICZM			2	2	2			1	12	2
3	Ensure potential terrestrial and marine pollution sources are adequately identified and covered in ICZM				2					6	2
4	Develop key demonstration sites using best practice ICZM at which seabird conservation is highlighted			2	2				1	11	2
	<b>Component 2: Education, public awareness and community participation</b>										
1	Produce, publish and disseminate general education and awareness materials on the importance of seabirds	2	2	2	1	2	1	1		21	1
2	Develop special awareness campaigns aimed at target groups	3	2	1	2	2	1	3		28	1
3	Develop strong links with decision-makers	2	2	2	2	2				20	1
4	Develop strong links with the mass media for dissemination of major newsworthy items	2	2	2	2	2	1	2		26	1
5	For each country, identify and develop consultative processes with the key stake-holders	2	2	1	2	1	2	1		22	1
6	Develop a public awareness campaign on the effects of pollution on the terrestrial and marine environments				2	2				7	2
7	Increase awareness among stakeholders of the impact of introduced predators							3		7	2



		Disturbance	Exploitation	Habitat degradation	Marine pollution	Terrestrial pollution	Fishing*	Predators	Global warming	Combined score	Priority
2	If appropriate, develop, in consultation with key stakeholders guidelines for sustainable harvesting		2							4	3
<b>Component 5: Research and monitoring</b>											
1	Initiate research into key aspects of seabird biology and ecology of high priority species	1	1	2	1	1	2	2	1	20	1
2	Define habitat condition, species population, breeding success and survival rate targets	1	1	2	1	1	2	2	1	20	1
3	Conduct additional surveys to ensure that all key sites for seabirds are identified	1	1	1		1	1	1	1	11	2
4	Develop a regional system of monitoring environmental threats to seabirds	1	1	1	1	1	1	1	1	14	2
5	Establish a regionally coordinated comprehensive long-term monitoring programme at key seabird sites	1	1	1	1	1	1	1	1	14	2
6	Assess the status, distribution and condition of the major coastal habitats in the RSGA			2	1	1			1	9	2
7	Determine and monitor the extent, intensity and impact of egg and chick collecting	1	2							7	2
8	Undertake research into, followed by development of, methods to reduce the impact of mammalian predators on seabirds							3		7	2
9	Investigate the impact of fisheries practices on seabird populations in the Region						2			2	3
10	Investigate the feasibility of Indian House Crow control methods							2		4	3
<b>Component 6: Strengthening legislation</b>											
1	Where necessary further develop policy and legislation to ensure effective protection of MPAs	3	3	2	2	1	1	1		28	1
2	Encourage all countries of the Region to join the CBD, CMS and other relevant conventions	1	1	2	1	1	1	1		16	2
3	Where required, further develop relevant national legislation defining safe shipping routes and passages				2					6	2
4	Examine the feasibility of establishing International Maritime Organization “areas to be avoided”				2					6	2
5	Ensure ratification of relevant marine pollution conventions				2					6	2
6	Review and update the conservation status of the Region’s seabirds in each country	1	1	1						7	2
7	Incorporate international ‘best use’ guidelines on environmental management	1	1	1	1	1	1			11	2

