Kingdom of Bahrain

Public Commission for the Protection of Marine Resources, Environment and Wildlife

General Directorate for Environment and Wildlife Protection

Bahrain First National Report
To the Convention on Biological Diversity

2006

1. EXECUTIVE SUMMARY

This report presents the first thorough assessment of the implementation of the Convention on Biological Diversity (CBD) in the Kingdom of Bahrain. The report was prepared with acknowledged technical support from the United Nations Development Program (UNDP). The content reflects rapid assessment of available information in addition to consultation with many key governmental and non-governmental organizations as well as individuals with particular expertise or knowledge. Because of insufficient biodiversity information baseline, a qualitative research strategy was adopted during the preparation of this report.

The kingdom of Bahrain is an archipelago of around 40 low-laying islands in addition to numerous islets, shoals and patches of reefs situated off the central southern coast of the Arabian Gulf. The country occupies a total area of about 728 km^2 and has sovereignty over approximately 3000 km^2 of territorial waters. The terrestrial landscape in Bahrain is predominately arid desert with limited inland waters. Alternatively, the marine biotopes are diverse albeit the prevailing harsh physical environment and include extensive sea grass beds and mudflats, patchy coral reefs as well as offshore islands.

Pearl diving formed a thrived industry substantially contributing to the national economy before it collapsed in the last century. The principal current sustainable uses of the components of biodiversity include an active, but declining food fishery and a declining, but diversifying agriculture.

Many measures have been adopted to promote the conservation and sustainable use of biodiversity in Bahrain. The legislative biodiversity framework is based on a wide range of national laws and multi-lateral agreements. Of particular note, the Kingdom of Bahrain signed in 1992, and, subsequently, ratified in 1996 the Convention on Biological Diversity.

There are one terrestrial and five marine declared protected areas in Bahrain. Of exceptional international importance, Hawar Islands Protected Area provides valuable feeding and breeding grounds for a variety of migratory seabirds. The breeding colony of Socotra cormorant on Hawar Islands is the largest in the world, and the dugongs foraging around the archipelago form the second largest dugong aggregation after Australia. Hawar Islands have been under full protection, and, hence, they are still maintained in pristine status with high level of ecosystem integrity. Al-Areen Wildlife Park and Reserve maintains breeding populations of rare and likely threatened species including mammals, birds, reptiles and amphibians. Successful captive breeding and re-introduction programs undertaken by Al-Areen have promoted the recovery of rare antelopes, such as the Arabian sand gazelle. Date palm tissue culture employing advanced techniques has been launched in attempt to recover the outstanding socio-economic importance of date palms. Public awareness programs are implemented on regular basis, and the provisions of promoting the conservation and sustainable use of biodiversity have been incorporated into the national educational curricula.

Due to the limited scale of the monitoring programs, it was difficult to draw thorough quantitative conclusions regarding the status of and trends in biodiversity at the ecosystem, species and genetic levels. The trends at the ecosystem level seem unlikely to be promising given the accelerated urbanization, particularly in the northern Bahrain.

Urbanization is the major threat to the components of biodiversity in Bahrain. A considerable proportion of the coastline has been modified by coastal development involving both dredging and infilling operations. Other major anthropogenic stresses on local biodiversity include industrial and oil pollution, over-fishing and invasive alien species.

No National Biodiversity Strategy and Action Plan (NBSAP) has been developed in Bahrain. In attempt to allocate additional funding to the management of biodiversity, an enabling activity proposal primarily aiming to develop the NBSAP was submitted in 1996. However, based on interim criteria, Bahrain has been considered, by the financial mechanism, illegible for financial and technical assistance.

Recently, the National Environment Strategy, including a chapter dedicated to biodiversity, has been prepared and is under consideration for adoption by the competent national authorities. Assuming it is adopted and implemented, the NBSAP shall promote the conservation and sustainable use of biodiversity in Bahrain in light of the provisions of the CBD.

ACRONYMS

CBD	Convention on Biological Diversity
CITES	Convention on International Trade in Endangered Species
COP	Conference of the Parties
EIA	Environmental Impact Assessment
GCC	Gulf Cooperation Council
GDEWP	General Directorate for Environment and Wildlife Protection
GDMR	General Directorate of Marine Resources
IUCN	World Conservation Union
NBSAP	National Biodiversity Strategy and Action Plan
NES	National Environment Strategy
NGO	Non Governmental Organization
PCMREW	Public Commission for the Protection of Marine Resources, Environment and Wildlife
ROPME	Regional Organization for Protection of the Marine Environment
UNDP	United Nations Development Program
UNEP	United Nations Environment Program

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2.1. Contracting Party

The Kingdom of Bahrain

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3. INTRODUCTION

3.1. The Kingdom of Bahrain

The kingdom of Bahrain is an archipelago of around 40 low-laying islands and islets in addition to numerous shoals and patches of reefs situated centrally off the southern coastline of the Arabian Gulf. Located between the eastern shore of Saudi Arabia and the western coast of the Qatar Peninsula, Bahrain occupies a total land mass of about 728 km^2. The country is delimited by 126 km long coastline and has sovereignty over approximately 3000 km^2 of territorial waters.

Climate of Bahrain is subtropical predominantly featured by high temperature and humidity levels. Mean air temperature fluctuates between 14ºC and 41ºC, and the annual rainfall is in the range of 39-128 mm.

With current annual growth rate about 3.6%, the total population of Bahrain in 2005 reached over 700,000 which represent a dramatic tripling of the population since 1971. Population density is relatively high particularly in the coastal strip along the northern and eastern coasts of the main island.

Prior to the discovery of oil in early 1930s, the economy of Bahrain was predominately trade-based taking advantage of the strategic location of the country in the Arabian Gulf. Pearl industry was a stone corner to the national economy before it collapsed following the introduction of cultivated pearls into the international market. At present, oil and natural gas, trade, industries and telecommunication significantly contribute to the economy of Bahrain, and there is accelerated transition towards professional financial services.

3.2. Bahrain and the CBD

The Convention on Biological Diversity (CBD), negotiated under the mandate of the United Nations Environment Programme (UNEP), was opened for signature on 5 June 1992 at the Earth Summit conducted in Rio de Janeiro, Brazil, and entered into force on 29 December 1993. There are currently 188 Parties to the Convention, which principally aims to promote the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of benefits arising from the use of genetic resources. The Kingdom of Bahrain signed the CBD on 6th September 1992 and formally ratified it on 8th August 1996.

3.3. Report Layout and Methodology

In accordance to the provisions of Article (26) of the CBD, parties are committed to present a series of national reports to the Conference of the Parties (COP) on the measures taken to promote the implementation of the convention.

Due to financial constrains, no comprehensive strategies or plans, primarily dedicated to the implementation of the convention, have been developed in Bahrain. Because of the financial obstacles, also, Bahrain has not been able to submit the national reports requested by the COP.

This document represents the first national report provided by Bahrain to the CBD, and aims to achieve the following objectives:

- to evaluate and promote the national implementation of the CBD in Bahrain
- to describe the status and to assess trends in biodiversity of Bahrain
- to recognize the major threats to biodiversity in Bahrain
- to identify the obstacles encountered in the implementation of the convention in Bahrain
- to facilitate the decision making processes of the CBD
- to encourage the exchange of information and experience among Parties to the CBD regarding the implementation of the Convention

The report was prepared following the fourth guidelines of the national reports, and consists of the following major sections:

- Section-3: Overview of Biodiversity Status, Trends And Threats
- Section-4: Current Status Of National Biodiversity Strategies And Action Plans
- Section-5: Biodiversity Goals and Targets and the Contribution to the Implementation of CBD
- Annex-I: Standardized Questions for Analytical Purposes

It is worth mentioning that, with the exception of the first section, the remaining parts present responses to a series of pre-defined questions.

The report was prepared with acknowledged technical support from the United Nation Development Program (UNDP). The content of the report was mainly sourced through the following:

- consultation with concerned governmental bodies, non-governmental organizations (NGO) and persons held during a workshop dedicated to this purpose
- interviews with key experts and decision makers responsible for the conservation of biodiversity and the implementation of the CBD in Bahrain
- preliminary review and evaluation of the relevant background documents

It has to be noted that albeit there has been a notable deal of ecosystem and species level research in Bahrain, no central systematic biodiversity information baseline has been developed. Accordingly, it was difficult to conduct quantitative assessment of biodiversity status and trends as well as the effectiveness of biodiversity management in Bahrain. Alternatively, the key methodology adopted during the preparation of this report was a qualitative research strategy. An accurate quantitative assessment remains necessary to draw thorough conclusions about the biodiversity sector in Bahrain.

4. BIODIVERSITY STATUS, TRENDS AND THREATS

This section summarizes the status of and trends in as well as the major threats to various components of biodiversity in Bahrain. It also outlines the key measures undertaken by Bahrain to promote the implementation of the provisions of the convention.

4.1. Status of Components of Biodiversity

4.1.a. Ecosystem Level

Apart from a narrow fertile strip extending along the northern and north western coastline, the desert environment predominates the terrestrial landscape in Bahrain. Despite the barren appearance of the desert of Bahrain, it supports recognizable diversity of vascular plants providing food and shelter for many animals such as mammals, birds, reptiles, arachnids and insects.

The northern and western coastal areas have been heavily cultivated with date palms and alfalfa plantations for thousands of years forming a biologically important habitat. Indeed, date palm farms are the most diverse terrestrial habitat in the country supporting a wide range of introduced and native species, including vascular plants and algae, insects, brackish water fish, amphibians as well as resident and migratory birds. These farms were once watered by numerous freshwater springs, which, in turn, represented the most biologically diverse inland water ecosystem. Sadly, however, the freshwater springs have vanished due to over-exploitation of underground water.

Relative to terrestrial and inland ecosystems, Bahrain supports a wider range of marine habitats in spite of the prevailing harsh physical marine environment. They include inertial habitats such as rocky shores, mudflats, salt marshes, mangrove swamps and sandy beaches as well as sub tidal habitats like sea grass beds, sub tidal sands and muds and coral reefs.

The extensive limestone cliffs on some Hawar islands, such as Umm Hazwarah and Al-Wakurs, are the only few examples of classic rocky shores found along the coastline of Bahrain. The distribution of mud flats is usually restricted to low-energy sheltered areas, like Tubli Bay. Mudflats in Bahrain are distinguished by high primary productivity and, thus, provide valuable feeding grounds for a variety of resident and migratory seabirds. The monospecifc mangal of the black mangrove *Avicennia marina* forms a critical environment in Tubli Bay which is naturally found no where else around the country. Classic sandy beaches are restricted to the south, south-west and some offshore islands, such as Mashtan. In contrast, the mixed sand/rock habitat formed by a rocky substrate covered with a sand veneer is a dominant coastal habitat both in the intertidal and sub tidal areas.

Sea grass beds are amongst the most distinct key coastal habitats in Bahrain in terms of their environmental and socio-economic importance. Covering extensive areas off the northern and eastern coasts, sea grass beds are important foraging grounds for some threatened species such as the sea-cows *Dugong dugong* and the green turtle *Chelonia*

mydas. The economic value of sea grass meadows is stemming from their importance as feeding grounds for the commercially important rabbitfish *Siganus canaliculatus*, nursery areas for the commercial prawn *Penaeus semisulcatus*, and a refuge for a high density of the spats of the pearl oyster *Pinctada radiata*.

Despite the rapid development pace in Bahrain, it is unlikely that the desert habitat is at immediate risk which is attributable to its extensive spatial coverage. In contrast, it is probable that the biological wealth of the agricultural, inland waters, as well as marine and coastal habitats is threatened at present. The total area of date palm farms has declined due to the accelerated urbanization in the northern part of the country. Palms, which were once almost flooded by freshwater, now require surface irrigation and in some areas there are desiccated. Without doubt, the status of the biologically rich freshwater springs is critical. They have vanished because of the over-abstraction of underground waters. Most intertidal habitat types extending along the northern and north eastern coastline of the country have been modified by coastal development. This is particularly true for mudflats and mangrove swamps in Tubli Bay which had been subjected to non-sustainable reclamation activities undertaken during the 1950s. The remaining mangal in Ras-Sanad appears overall healthy, but given its current limited geographical area, it is likely that this habitat type is threatened. Sea grass meadows still cover a considerable proportion of shallow waters around Bahrain. However, sea grass beds are regularly subjected to shrimp trawling, and, of greater impacts, reclamation and dredging activities. Coral reefs are naturally under considerable pressure because of the high salinity and temperature levels as well as the shallowness of seawater around Bahrain. In 1998, a bleaching event resulted in massive coral mortality (> 90%) at most reefs of Bahrain. At present, live corals form merely scattered patches at several reefs situated in deep waters.

4.1.b. Species Level

The total number of species which have been identified in Bahrain is 1361 species ranging from microbes to large mammals (Table 4.1). It is highly probable that this number is an underestimate since many taxa have not been adequately identified and inventoried.

About 357 species of wild vascular plants have been recorded in the desert and cultivated areas in Bahrain. Desert plants are predominately perennial or annual herbs and shrubs exceptionally adapted to the harsh desert environment. Interestingly, in association with the rapid urbanization pace in the country, the range of exotic crops has diversified. According to a temporary list updated in 1990, 21 species of butterflies have been reported. At least 20 species of reptiles and one species of amphibians are known to occur on the islands, and lizards are particularly abundant.

Bahrain offers important wintering grounds for many migratory birds, especially in spring and autumn months. Indeed, Hawar Islands, Tubli Bay and Maqaba have been recognized by Birdlife International as Important Bird Areas in the Middle East. Over 330 species of birds have been inventoried in Bahrain; of which 26 species breed on the

islands. The breeding colony of the socotra cormorant *Phalacrocorax nigrogularis* on Hawar Islands is the largest in the world. Similarly, the breeding colony of the western reef heron *Egretta gularis* on Hawar Islands is the largest in the Middle East.

Only 18 species of terrestrial mammals in addition to 3 species of dolphins are found in Bahrain. Gazelles, desert hares and hedgehogs can still be found in the wilderness. Of particular note, the dugong herd around Hawar Islands is the second largest after Australia. In a winter aerial survey over the western Arabian Gulf in February 1986, an aggregation composed of over 600 dugongs was reported southeast of Bahrain.

Table 4.1. The number of species, belonging to major morphological groups, identified so far in Bahrain. (Source: provisional species lists prepared in 2005; see Annex-IV)

Major Group	Number of Species
Algae	34
Vascular Plants	357
Corals	24
Annelids	27
Sea Shells (Gastropods and Bivalves)	184
Crustaceans	64
Echinoderms	13
Insects	39
Arachnids	6
Fishes	239
Amphibians	1
Reptiles	20
Birds	331
Mammals	22
Total Number of Species	**1361**

Because of the wide gaps in the available information, it is difficult at present to undertake thorough assessment of the status of most species inhabiting Bahrain. For the same reason, also, no national lists of threatened and endemic species have been developed. Probable status of major taxa is illustrated in Table 4.2.

Table 4.2. Likely status of selected species, belonging to major morphological taxonomic groups, in Bahrain.

Major Group	Likely Status of Selected Species

Major Group	Likely Status of Selected Species
Fish	• Populations of commercial species, particularly groupers and rabbit fish, are in slow decline; captive breeding and re-introduction programs for key species are undertaken at regular basis.
Amphibians	• Marsh frog is highly likely to be endangered due to the loss of freshwater springs; captive breeding programs have been undertaken by Al-Areen.
Reptiles	• The spiny tailed lizard is threatened by camping activities; breeding populations are maintained at Al-Areen. • Marine turtles are threatened through shrimp trawls; turtle exclusive device is under consideration. • Caspian terrapin seems highly probably to be threatened following the destruction of its major habitat (freshwater springs); captive breeding programs have been successfully developed by Al-Areen.
Birds	• Most migratory bird species breeding in Bahrain are stable in numbers or affected by other factors along migratory routes. • Breeding colonies of seabirds on Hawar Islands (e.g. osprey, sooty falcon, Socotra cormorant, western reef heron, white-checked tern, lesser crested tern and Caspian tern) are under full protection. • Wintering and passing seabird species likely to be declining due to the loss of intertidal habitats, in particular mudflats. • Several invasive species (e.g. Mina, Indian house crow and brown-necked raven) have successfully colonized inhabited areas. • White-cheeked bulbul is threatened by illegal hunting; strict regulation on the commercial handling of chicks and adults have been enforced and captive breeding programs have been established at Al-Areen.
Mammals	• Arabian Oryx is not native to Bahrain. It has been bred in captivity at Al-Areen and introduced on Hawar Islands intentionally to support the relevant regional efforts aiming to conserve this species. • Gazelles have been under pressure but still roam wild. Breeding populations are successfully maintained at Al-Areen and re-introduction programs have promoted the recovery of their populations in the southern Bahrain and on several

Major Group	Likely Status of Selected Species
	offshore islands. • Dugongs and dolphins, globally endangered, are under full protection, and it seems unlikely that they are endangered at national level. • Camels are introduced while rats and mice are invasive species.

4.1.c. Genetic Level

There is essentially no information available about the "status" of genetic diversity in plant or animal species in Bahrain.

4.2. Trends in Components of Biodiversity

4.2.a. Ecosystem Level

It is expected that the accelerated commercial, industrial and residential development and the associated increasing demands on natural resources will continue in the short and medium terms. This development trend may result in the destruction and/or deterioration of a range of coastal habitats as well as the cultivated lands. For that reason, it is probable that the trends in the marine and coastal, agricultural and inland water ecosystems are not promising.

The desert ecosystem covers a considerable geographical area in Bahrain. Additionally, most of the southern half of the main land and offshore islands are restricted. It seems unlikely that the desert environment will be at immediate risk in the near future. Indeed, assuming preset land use trends are allowed to continue, the terrestrial habitats in the southern Bahrain are suggested to continue in a natural or semi-natural state over the next two decades (see Table 4.3). It has to be noted, however, that urbanization (e.g. housing, racetracks, highways and luxury developments) is expanding southwards at a rapid pace.

Table 4.3. Ecosystem-level biodiversity trends and biodiversity management sectors in Bahrain. The sectors are pre-specified by CBD to promote consistent global categorization.

Sector	Expected Trends
Agricultural	• decline in cultivated area • increase in the introduction of non-traditional crops
Inland Waters	• depletion of underground aquifer • increase salinization of underground water • no likely recovery of freshwater springs
Marine	• increased pressure from fishing activities leading to decline in commercial species • Hawar Islands Protected area remains largely intact
Coastal	• accelerated coastline modification in the northern Bahrain through "reclamation" with major reduction in inter-tidal habitats • increase in the number and coverage of offshore artificial islands
Dry and Sub-Humid	• reduction in dry habitats in Northern Bahrain • rock desert habitats remain intact in southern Bahrain
Biodiversity Conservation	• enhanced biodiversity management following the implementation of the National Environment Strategy (NES)
Sustainable Use	• declines in traditional date palm harvesting • traditional fishing methods maintained • folk medicine maintained
Ecosystem Integrity	• considerable losses except on Hawar Islands and in southern Bahrain
Access and Benefits	• no program is likely to be developed in the near future
Financing	• relative increase in the financial resources allocated to biodiversity • increased international financial support

Sector	Expected Trends
Technology Transfer	• no program is likely to be developed in the near future

4.2.b. Species Level

It is expected that the status of threatened species suggested in Table 4.2 continues on the short and medium terms.

4.2.c. Genetic Level

There is essentially no information available enabling the assessment of the trends in genetic diversity in Bahrain.

4.3. Status of the Implementation of the CBD

4.3.a. National Strategies, Plans and Programs

Parties to the Convention on Biological Diversity are requested, in accordance to the provisions of Article (6), to develop national strategies, plans and programs promoting the conservation and sustainable use of biodiversity, and to incorporate the requirements of the conservation and sustainable use of biodiversity into relevant sectoral and cross-sectoral programs, plans and policies.

Following the ratification of the convention in 1996, Bahrain submitted an enabling project proposal to the UNDP requesting technical and financial assistance to facilitate the preparation of the National Biodiversity Strategy and Action Plan (NBSAP). The proposed project focuses on adapting existing plans and strategies to establish an effective framework for the sustainable management of biodiversity. The project was also intended to address the needs to integrate the requirements of the conservation and sustainable use of biological diversity into relevant sectoral and cross-sectoral plans, programs and policies. In particular, subsequent implementation of the project was expected to promote the conservation and sustainable use of biodiversity of Bahrain in line with the provisions of articles (6) and (8) of the CBD. However, based on interim eligibility criteria, Bahrain was considered illegible for financial funding and technical assistance under the CBD.

Due to financial constrains, no NBSAP has been yet developed in Bahrain. Nevertheless, many measures have been undertaken by Bahrain to satisfy some of the obligations towards the CBD (see below). However, in the lack of NBSAP outlining the overall national biodiversity policy, the management of biodiversity in Bahrain has been impeded by insufficient integration of the long-term strategic plans.

With the financial and technical support of the UNDP, Bahrain has recently prepared the National Environment Strategy (NES) which is currently under consideration for adoption by the competent national authorities. The strategy includes two chapters dedicated to biodiversity and marine resources sectors. The biodiversity chapter was deliberately prepared taking into account the objectives and the key requirements of the CBD in attempt to satisfy the obligations of Bahrain towards the convention. Assuming it is adopted and funding is made available, then implementation of the biodiversity section would logically take the form of preparation of a much more detailed NBSAP, which is, indeed, a high priority recommendation of the NES (see Annex-3).

4.3.b. Identification and Monitoring

Inventories of various components of biodiversity are a principal requirement to the decision making process of the conservation and sustainable use of biodiversity. Parties to the CBD are committed by Article (7) to identify and to monitor the components of biodiversity.

Most of the inventory efforts in Bahrain have focused on large organisms developing valuable species checklists of marine algae, vascular plants, marine crustaceans, marine gastropods and bivalves, marine fish, reptiles, amphibians, birds and mammals. There are still notable gaps in the biological inventories of many groups, including phytoplankton, zooplankton, bacteria, fungi, insects and arachnids. Also, the existing inventory lists need to be updated since most of the valuable identification works were undertaken during the 1980s and early 1990s.

It is worth mentioning that an extensive marine ecological survey, supported with satellite imagery, was conducted in 1985 and resulted in the preparation of a comprehensive marine habitat map prioritizing intertidal and sub tidal critical areas in terms of their biological sensitivity. During the survey, also, numerous marine species were recorded and provisional species lists of various major taxa were developed. Currently, a similar survey is being undertaken to update the findings of the previous survey, and to highlight any major change in the status of the components of marine biodiversity.

Similarly, monitoring of the components of biodiversity in Bahrain is limited. The sand gazelle and Arabian Oryx, re-introduced on Hawar Islands, are periodically monitored by Al-Areen's specialists. The breeding colonies of seabirds on Hawar Islands are monitored on regular basis for the intention to assess their status and trends. Monitoring of the coral reefs is undertaken, but by immature scientists. There is a pressing need to expand the monitoring programs in order to include other aspects of biodiversity.

4.3.c. Data Management

Effective management of data is a fundamental requirement for the long-term strategic biodiversity planning. Despite the large quantity of available data in Bahrain, there is a limited amount of the biodiversity baseline information. Indeed, the lack of a systematic

biodiversity information baseline was a major obstacle encountered during the preparation of the present report. Additionally, most of the previous studies and projects have emphasized academic and scientific aspects of biodiversity but only in rare occasions they have led to sustainable management of biodiversity. For those reasons, the NES calls for a more comprehensive approach to biodiversity information management and a renewed strategy for collecting and completing a central database.

4.3.d. Sustainable Use of Components of Biodiversity

Promoting the sustainable use of biodiversity is one of three major objectives of the CBD. Article (10) obligates parties to ensure that the exploitation of biological resources are managed in a sustainable manner in order to prevent or minimize any adverse impacts on biological diversity.

The sustainable use of the components of biodiversity in Bahrain (such as natural pearls, fish and date palms) is ancient and returns back to approximately 2300 B.C. Through the phases of the ancient Dilmun and subsequent civilizations, the islands of Bahrain have had significance in the economy and trading routes of the Arabian Gulf for millennia. Pearl industry used to be stone-corner of the national economy until the last century when it collapsed following the introduction of cultivated pearls into the international market. Albeit the diversification of the national economy after the discovery of oil, biological resources still provide goods and services of particular socio-economic significance, which include the followings:

<u>Agriculture</u>

Agriculture in the northeast corner of Bahrain was developed many centuries ago and consists of date palm plantations intercropped with other vegetable crops. The date palm is the most important plant species in the history of Bahrain offering uncountable valuable foods and tools. All these uses have been sustainable and have not imposed any adverse impact on the date palms. Indeed, the national legislations mandate farmers to ensure that date palms are adequately maintained. It is also prohibited to take off date palms unless it is intended for proliferation purposes.

However, following the discovery of oil, the socio-economic roles of the date palms have declined although the plant still offers fruits and raw materials for handicrafts. One of the major challenges facing the agricultural sector in Bahrain is freshwater supplies, which are considerably declining due to the increasing demands associated with the accelerated population growth. In this context, the government has adopted plans and started to implement programs to re-use treated wastewater for irrigation purposes in attempt to overcome the increasing shortage in freshwater. Also, loans are provided to farmers intending to launch programs dedicated to the protection of date palms.

Fisheries

The most important current use of the components of biodiversity in Bahrain is the food fishery. Although fisheries are not so significant from an economic point of view in Bahrain, they are often seen as being of heritage value since the early economy (pre-1960) was, to a large extent, dependent on fishing and trading activities. All fisheries in Bahrain are artesian in nature and no large-scale industrial fisheries are being undertaken after the band of industrial shrimp trawling in 1998. Recreational fishing of large pelagic and demersal species, mainly by small speed boats, is significantly growing in popularity. The shrimp fishery has traditionally been one of the most important fishery in Bahrain although catches have considerably declined over the last decade. Over 90% of the shrimp catch is of *Penaeus semisulcatus* despite 6 other shrimp species are also caught.

Concerns have increased to adopt effective measures in attempt to minimize adverse stresses imposed by over-fishing. All destructive fishing methods, such as explosions, poisons and polythene nets, are prohibited. Alternatively, the sustainable traditional fishing methods, such as the wire (gargoor) and barrier (haddrah) traps are encouraged and maintained. For instance, only traditional fishing (by line as well as wire and barrier traps) is permitted in the marine environment bordering Hawar Islands Protected Area. For the intention to ensure the sustainability of shrimp stock, shrimping is band annually during the recruitment period.

Herbal Medicine

Traditional herbal remedies have been undertaken for hundreds of years in Bahrain. Interestingly, folk medicine is still attractive for some locals albeit the sweeping trend of modern medicine and forms an exceptional part of the national heritage. At least 20 different indigenous plant species have been recorded to have potential medicinal uses. To treat numerous afflictions, fresh plant parts (e.g. leaves and seeds) or even the whole plant may be directly used, or dried, and subsequently boiled and extracted prior to consumption. It seems highly probable that the usage of wild plants for medicinal purposes is sustainable and imposes on adverse impacts on biodiversity of Bahrain.

4.3.e. Institutional Capacity

Governmental Organizations

The conservation of biodiversity in Bahrain falls within the responsibilities of the Public Commission for the Protection of Marine Resources, Environment and Wildlife (PCMREW). The PCMREW is the competent authority with a wide mandate to protect the environment, to conserve biodiversity and to ensure the sustainability of marine resources. The PCMREW is divided into two key general directorates (see Figure 4.1). The General Directorate of the Environment and Wildlife Protection (GDEWP) conserves wildlife and establishes the protected areas while the General Directorate of the Protection of Marine Resources (GDPMR) imposes regulations on fishing activities to protect commercial and endangered marine species. The Ministry of Municipality and

Agriculture Affairs is responsible for the conservation of cultivated plant and domesticated animal species.

Research Institutes

The College of Sciences and the Deanship of Scientific Research at the University of Bahrain conduct academic biodiversity researches with particular reference to marine assemblages and medicinal plants. The Arabian Gulf University runs MSc. programs entitled the "Desert and Arid Zones" and "Biotechnology". The later university, also, maintains a herbarium preserving a considerable number of wild plant species found in Bahrain and the neighboring countries. Bahrain Center for Studies and Research has undertaken many valuable researches pertaining to the conservation of marine biodiversity. The center is currently conducting a comprehensive survey aiming to identify the components of biodiversity in the territorial waters of Bahrain and to assess their environmental sensitivity.

Non-governmental Organizations

The first civil society group involved in biodiversity conservation in Bahrain was established in 1976. At present, there are several NGOs adopting the conservation of biodiversity as one of their principal objectives. The interests of these NGOs include, inter alias, biological inventories, biodiversity publications and public awareness.

It has to be noted that most governmental and non-governmental organizations as well as institutes involved in the conservation and sustainable use of biodiversity in Bahrain are considerably understaffed and underfinanced indicating the necessity of adopting large-scale effective capacity building programs.

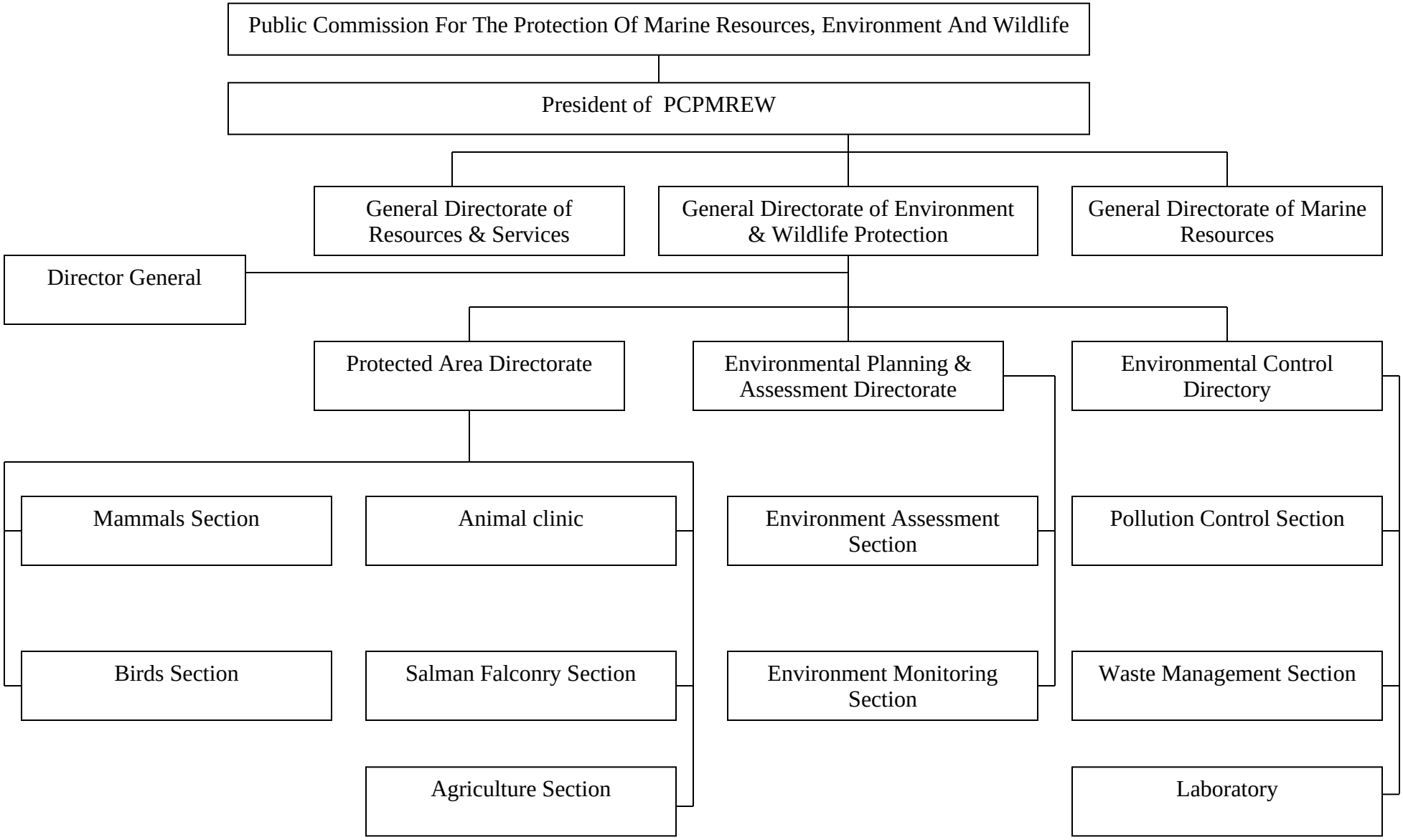

Figure 4.1. Flowchart illustrating the organization of the Public Commission for Protection of Marine Resources, Environment and Wildlife.

4.3.f. Legislative Framework

The legislative biodiversity framework in Bahrain is based on a range of national laws as well as regional and international agreements. The key environmental legislations are summarized in Tables II.1 and II.2 included in Annex-2. Of particular reference, Decree (2) 1995 with respect to the Protection of Wildlife, Decree (21) 1996 with respect to the Environment as well as Decree (20) 2002 with respect to the Regulation of Fishing and Exploitation of Marine Resources outline the overall frameworks of the national policy for the conservation of wildlife, environment and fisheries, respectively. At regional and international levels, Bahrain is a party to the CBD and the Convention on the Conservation of Wildlife and Natural Habitats in GCC Countries and has, also, acceded to the Convention on Wetlands of International Importance Especially as Waterfowls Habitat (RAMSAR).

The main challenge facing Bahrain in this regard is to strictly enforce the national legislations and to allocate the necessary resources for the implementation of the regional and international multi-lateral agreements.

4.3.g. In-situ Conservation

In accordance to the provisions of Article (8) of the CBD, parties are requested to adopt a series of measures to conserve the components of biodiversity in their natural environments, which include: establishment of protected areas, protection and restoration of threatened species and control of alien species.

Protection Inside the Protected Areas

Protected areas are amongst the most effective tools used by countries to promote the in-situ conservation of biodiversity. There are five key designated protected areas in Bahrain; namely Al-Areen (a desert area including a zoological and botanical park as well as a breeding center for threatened species), Tubli Bay (a productive shallow bay), Hawar Islands (an archipelago internationally important for birdlife), Mashtan (an offshore island) and Dhohat Araad (a sheltered bay). The biological importance and the status of biodiversity management in the former three protected areas are outlined below:

<u>Al-Areen Wildlife Park and Reserve</u>

The Al-Areen Wildlife Park and Reserve is the centerpiece of the Bahrain terrestrial protected area system and managed on daily-basis. Situated adjacent to the central western coastline of the main island, Al-Areen occupies a total area of about 8 km^2 which is divided equally into a fenced reserve and a zoological and botanical park. The park is built to modern standards allowing most animals to live in open semi-natural habitats

with a minimum of enclosure. The protected area harbors representatives of indigenous plants and animals in addition to exotic faunal species from Africa and west and south Asia. The park also offers a modern facility supporting the falconry sport and the associated heritage in Bahrain.

The key objectives of Al-Areen Wildlife Park and Reserve are to promote scientific research, ecotourism, public awareness in addition to conservation of biodiversity in Bahrain. Currently, the park and the reserve are becoming an essential part of tourism development activity in Bahrain attracting visitors of all age groups. The captive breeding programs undertaken by Al-Areen have succeeded in the re-introduction of sand gazelle and Arabian Oryx into open protected desert areas such as Hawar Islands.

It has to be noted that development has been accelerated around Al-Areen, and the designation of a buffer zone deems necessary to promote the integration between the protected area and the bordering desert ecosystem.

Tubli Bay Protected Area

Tubli bay combines a variety of marine biotopes such as mangrove swamps, extensive mudflats and rocky shores. In Bahrain, the mangrove grows only in Tubli Bay, and, naturally, found no where else around the country. With its productive mudflats, Tubli Bay serves as important feeding and breeding grounds for migratory and resident birds. Also, the bay is a nursery ground of exceptional significance for commercial shrimps and harbors a variety of inertial and sub tidal marine biota.

Unfortunately, the area has not been well managed or protected. Due to unsustainable reclamation operations, the total area of the bay has declined from approximately 25 km^2 to 13 km^2. Most of the acquired land has been allocated to the construction of causeways and highways and the erection of houses. Other anthropogenic impacts in the bay include five sand washing plants, a major outfall discharging secondary-treated wastewater, and illegal dumping of municipal solid wastes.

Tubli bay was declared as a protected area in 1995 and designated as a RAMSAR site in 1997 in attempt to promote the protection of the coastline from coastal development. However, strict regulations associated with effective management are currently of pressing need to prevent further ecosystem collapse in Tubli Bay.

Hawar Islands Protected Area

Hawar Islands archipelago is the largest Protected Area in Bahrain. Relative to the other protected areas in Bahrain, Hawar Islands are featured by the highest level of ecosystem integrity with extensive desert, mudflats and sea grass beds serving as valuable feeding and breeding grounds for a wide range of terrestrial and marine species. Of particular reference, the dugong herd inhabiting the shallow waters around Hawar Islands is the

second largest dugong's assemblages in the world after Australia. The breeding colonies of Socotra cormorant *P.nigrogularis* is the largest in the world, and those of the western reef heron *E.gularis* is the most numerous in the Middle East. The islands, also, are important nesting areas for the osprey *Pandion haliaetus* and the sooty falcon *Falco concolor.* Benthic invertebrate and fish assemblages are diverse and provide valuable food sources for the thousands of birds wintering or breeding annually on those offshore islands. As part of the captive breeding and re-introduction programs undertaken by Al-Areen Wildlife Park and Reserve, sand gazelles and Arabian Oryx have been released on Hawar Islands.

Declared as a protected area in 1996 and designated as a RAMSAR site in 1997, Hawar Islands have been considered the most Important Bird Area anywhere in the region. The entire island group and the associated territorial waters are under full protection, and hunting and fishing are particularly prohibited. Exceptionally, fishing by traditional methods is intentionally permitted to encourage the protection of these sustainable methods. Apart from a small constrained resort area, public access to the majority of Hawar Islands is restricted and continuously monitored by the Coast Guards. For those reasons, Hawar Islands are still largely maintained in pristine condition.

It has to be noted that due to financial obstacles, an integrated protected areas system has not been developed in Bahrain. Financial resource need to be allocated to increase the manpower and technical capabilities of the Protected Areas Directorate at the GDEWP, which shall pay considerable attention to the development of integrated biodiversity conservation plans for all protected areas and their associated buffer zones.

Protection Outside the Protected Areas

Some measures have been undertaken to encourage the in-situ conservation and the sustainable use of biodiversity outside the designated protected areas, which include the followings:

Restricted Areas

Most of the desert environment in the southern half of the main island (i.e. Bahrain) is restricted and still in a natural condition. This area is known to support populations of the sand gazelles, desert hares and several seabird breeding colonies like the white-cheeked tern's colony at the southwestern corner. Similarly, many offshore islands, which harbor a variety of life forms, are restricted and, hence, protected from the increasing pressures imposed by the accelerated population growth. For instance, it has been reported that Umm Na'ssan Island supports a considerably large community of antelopes found nowhere else in the country. However, these restricted areas need to be surveyed in order to develop biological inventories, and subsequently, managed and monitored by the GDEWP.

Fisheries

Management of fisheries in Bahrain has been undertaken since the 1960s and continues to predominately focus on fish stock, fishermen's welfare and marine environmental protection.

As stated earlier, all destructive fishing gear, such as explosions, poisons and polythene nets, are legally prohibited and large-scale industrial fishing has been banded. During the recruitment season, Bahrain annually adopts full shrimp closure. All species of marine dolphins and sea cows are protected from fishing activities. On the other hand, although illegal, turtles are occasionally trapped in the shrimp trawls. As a result of collaboration between the relevant authorities in Bahrain and Saudi Arabia, an effective turtle exclusive device of high international standards has been developed and it currently is under consideration. Recently, a Fisheries Enforcement Committee has been established with a large mandate to monitor the enforcement of domestic fisheries regulations.

It has to be noted that Bahrain faces a number of challenges in fisheries management especially the threats arising from the destruction of marine habitats by land reclamation, over-fishing and the insufficient enforcement of fisheries legislations.

Artificial Reefs

As part of the compensation measures of large-scale resort projects undertaken in the marine environment, concrete reef domes have been deployed at selected sandy offshore areas. The artificial reefs appear to establish a biologically diverse habitat in areas which are often described as "marine deserts". They form hard substrata encouraging the settlement of macro-algae and sessile fauna and provide refuge for demersal fish. Monitoring programs need to be expanded to assess the ecological and socio-economic feasibility of the artificial reefs projects in Bahrain.

Threatened Species

No national list of threatened species has been developed in Bahrain, but some species, which are globally threatened, are known to inhabit the country.

In accordance to the national legislations, hunting in the whole country is prohibited, with particular reference to dugongs, dolphins, Socotra cormorant, osprey, sooty falcon and turtles. Additionally, the cross-boundary transfer of threatened species, in particular falcons, is under control at the ports of Bahrain.

The dugongs *D.dugon*, vulnerable according to the IUCN's Red List, have been under full in-situ protection in Bahrain, and it seems highly likely that they are not threatened at the national level. On the other hand, the populations of several indigenous species have noticeably declined, particularly due to the loss of natural habitats. It is possible that the

Caspian terrapin *Clemmys (Mauremys) caspica* and, to a lesser extent, the marsh frog *Rana ridibunda* are threatened following the disappearance of freshwater springs. Captive breeding programs for the Caspian terrapin and the marsh frog have been launched and implemented at Al-Areen Wildlife Park and Reserve. The population of the white-checked bulbul *Pycnonotus leucogenys* might have declined, possibly due to illegal hunting and loss of habitats (cultivated land). Strict regulations on the commercial handling of chicks and adults of the white-checked bulbul have been enforced and captive breeding programs have been established at Al-Areen. The catch of the commercial streaked rabbitfish *Siganus javus* and the white-blotched grouper *Epinephelus multinotatus* has substantially declined during the last decade. The National Center for Mariculture is investigating the feasibility of adopting captive breeding and re-introduction programs in attempt to recover their populations. Of particular note, the successful breeding programs undertaken at Al-Areen have resulted in the re-introduction of the sand gazelle *Gazella subgutturosa* and the Arabian Oryx *Oryx leucoryx* in the open desert at selected restricted areas, such as the southern Bahrain and several offshore islands.

Alien Species

Concerns of public and specialists have increased regarding the spread of the Indian house crow *Corvus splendens* and the brown-necked raven *Corvus ruficollis* in the northern Bahrain. Abnormally high populations of these invasive birds have successfully colonized the inhabited and cultivated areas, particularly in the northern Bahrain. Currently, measures have been implemented by Al-Areen to combat the spread of these birds.

Also, Bahrain is actively contributing in a regional action plan aiming to monitor and to control the spread of invasive species released via ballast water in ROPME Sea Area and a regional pilot project is being implemented.

Camping

Increased camping activities at the Sakhir may represent a considerable threat to the biodiversity of the desert environment at that area. The temporal and spatial extents of camping activities have been restricted in attempt to minimize their impacts on wildlife. Additionally, intensive programs have been launched to increase awareness and to raise consideration of campers towards the conservation and sustainable use of the components of biodiversity at the camping area.

4.3.h. Ex-situ Conservation

Besides in-situ conservation and in line with the provisions of Article (9) of the CBD, Bahrain has developed and implemented programs and maintained facilities dedicated to the conservation of selected species outside their natural environment.

Al-Areen Wildlife Park and Reserve

There has been extensive work undertaken at Al-Areen on the captive breeding of native and exotic species, which include reptiles, birds and mammals. Al-Areen is also co-operating with other neighboring countries through sharing expertise and exchanging animals. Al-Areen has successfully implemented captive-breeding programs for potentially threatened species such as the Arabian sand gazelle, Arabian Oryx, Caspian terrapin, marsh frog, white cheeked bulbul and greater flamingo. Recently, also, Al-Areen has established a botanic garden aiming to conserve selected indigenous wild plant species.

Mariculture

The National Mariculture Center at the General Directorate of Marine Resources (GDMR) is one of the leading facilities in the captive breeding of commercial fish species in the Arabian Gulf. The center has successfully proliferated selected fish species of high commercial value such as the grouper *Epinephelus* sp., rabbit fish, *Siganus canaliculatus* and subaity bream *Sparidentex sp.* In attempt to reduce the stresses of over-fishing on the recruitment of commercial species, thousands of juvenile fish (fingeries) are released annually into the marine environment. The center, also, exports thousands of fingeries to several aquaculture farms in the neighboring countries.

Date Palm Tissue Culture

The Date Palm Tissue Culture Laboratory at the Ministry of Municipality and Agriculture Affairs has implemented a program for the propagation of highly commercial varieties of date palms using advanced tissue culture techniques. It is hoped that the re-introduction program adopted by this laboratory succeeds to recover and rehabilitate the populations of commercial date palms and, hence, maintain the associated significant heritage associated with agriculture.

4.3.i. Public Education and Awareness

Article (13) of the CBD argues parties to encourage public appreciation towards the conservation and sustainable use of biodiversity. On regular basis, the PCMREW

implements several programs aiming to raise public awareness about environmental protection issues (such as biodiversity conservation) through various media. Partnership has been established with some schools at various educational levels to undertake joint programs intended to raise the consideration of students towards the protection of the environment. Also, a joint committee between the PCMREW and the Ministry of Education has been initiated and committed to facilitate the incorporation of various subjects pertaining to the environmental protection, including the conservation and sustainable use of biodiversity, into the national educational curricula.

Involvement of local people in the decision making process of projects likely to impose adverse impacts on the components of biodiversity has noticeably enhanced recently. For instance, representatives of local municipal councils are consulted during the Environmental Impact Assessment of large-scale industrial, housing and resort developments. In addition to their valuable efforts pertaining to public awareness, representatives of concerned NGOs participated in the preparation of the NES.

4.3.j. Ecotourism

Tourism is considerably contributing to the economy of Bahrain and this sector is effectively integrated into the national economic planning. Alternatively, eco-tourism is not well-developed in spite of the vast ecological potentials for eco-tourism in the country, which include: coral reefs, sea grass beds, mangrove swamps and the variety of life on and around Hawar Islands.

Al-Areen Wildlife Park and Reserve is attracting an increasing number of visitors predominately residents and tourists from neighboring countries. Indeed, the number of visitors to Al-Areen during special occasions usually exceeds the capacity of the wildlife park. Plans are under consideration to develop a wetland institute at Ras-Sanad mangrove area (situated at the south west corner of Tubli Bay). The key objectives of the proposed development are to promote public awareness and appreciation and to encourage scientific research about the marine environment of Bahrain with special reference to the mangrove habitat. The project proposal and master plan were finalized in 1999, but the project has not been yet implemented due to financial constrains.

Concerns have increased to promote eco-tourism in Bahrain provided it is managed within an effective regulatory framework minimizing any likely adverse impacts on biodiversity. Ecotourism represents one of the potential financial sources supporting the management of biodiversity in Bahrain. There is a challenge to promote this sector through various activities, which may include, inter alias, diving, wildlife viewing as well as home and parks visits.

4.3.k. Financial Resources

Most of the funding allocated to the conservation and sustainable use of biodiversity in Bahrain is provided by the government. The concerned governmental organizations, such as the PCMREW and the Ministry of Municipality and Agriculture Affairs, as well as some research institutes are largely dependent on budgetary allocations. Additionally, Al-Areen and the GDPMR are funded through entrance, and licensing fees, respectively. Non-governmental organizations are funded through membership fees and occasional donations. Contributions from the private sector are usually in the form of limited occasional donations.

Despite the regular financial governmental support, the biodiversity sector in Bahrain remains considerably under-funded. This has substantially impeded the efforts of Bahrain to develop and implement strategies, plans and programs primarily dedicated to meet its obligations towards the CBD. For this reason, Bahrain has attempted to allocate additional financial resources from international sources. As indicated earlier, Bahrain made in 1996 an application to the UNDP for financial support of an enabling project aiming to prepare the NBSAP. However, the project was not approved because Bahrain was considered illegible for financial support based on interim eligibility criteria adopted by the financial mechanism. On the other hand, Bahrain has received some financial and technical support from the relevant international organizations (including the UNDP, UNEP and UNESCO) to promote the implementation of other multi-lateral agreements such as those pertaining to climate change, desertification and ozone protection.

It appears that there is a pressing need to diversify the financial resources allocated to the conservation of biodiversity in Bahrain. Of greater importance, financial support of the financial mechanism of the CBD remains critically important to enable Bahrain to satisfy its commitments towards the convention.

4.4. Threats to Biodiversity in Bahrain

Over the long history of human settlement in Bahrain, the biological resources had been exploited in a manner ensuring their continuous viability. During the last century, however, the components of biodiversity have been subjected to increasing human-induced stresses which is, indeed, a challenge facing almost all developed and developing nations around the world. The key anthropogenic threats to biodiversity in Bahrain include, inter alias, the following:

<u>Urbanization</u>

With no doubt, the major threat to the components of biodiversity in Bahrain is urbanization which has dramatically accelerated in the country since the discovery of oil in 1930s. For instance, the expansion of housing in the northern Bahrain has reduced the

cultivated land's area. Of greater impacts, a substantial portion of the northern and north eastern coastlines has been irreversibly modified by infilling operations intended to create suitable lands for the rapidly-developing commercial, industrial and residential sectors. In addition to the siltation problem, reclamation results in complete loss of productive intertidal habitats. Dredging is usually undertaken in association with large-scale reclamation projects in order to provide the necessary fill materials and to facilitate navigation. Similar to infilling, dredging initiates high turbidity levels in the water column and results in complete destruction of sub tidal habitats.

Over-exploitation of Underground Water

The main underground freshwater aquifer in Bahrain is the Dammam which is shared with the Eastern Area in Saudi Arabia. Demand on freshwater has considerably increased during the last century in association with the sharply rising population growth and the accelerating urbanization and industrization. It is well recognized that the present underground freshwater extraction significantly exceeds the natural regeneration rate.

For a long time, Bahrain was famous of its numerous freshwater springs distributed not only on land but also in submerged marine areas. However, both land and submarine springs have sadly vanished due to over-exploitation of underground water. This has resulted in severe decline in the components of biodiversity associated with freshwater springs as well as notable deterioration in the agricultural habitat.

Pollution

Around 16 industrial outfalls (e.g. from sewage treatment, power and petrochemical plants) discharge a range of pollutants into the shallow waters bordering the north eastern coastline of Bahrain. Additional 5 sand washing plants release turbid effluent into the marine environment of Tubli Bay. It is possible that the discharged industrial and sand washing effluent imposes stresses on local biodiversity. Of particular reference, oil pollution is one of the key threats to the marine environment in the Arabian Gulf where massive oil spills occasionally cause adverse damages to coastal habitats.

It is worth mentioning that the quality of industrial and sand washing effluent is seasonally monitored and compared against relevant national environmental standards. Similarly, ambient water bordering selected outlets is seasonally monitored to ensure that the discharges impose no significant impacts on marine biota.

Over-fishing and By-catch

Taking into account the dramatic increase in the number of fishing vessels and gears as well as fishermen in Bahrain, it seems likely that the harvesting of commercial fish may exceed the sustainability limits of targeted species. The declining landings and catch rates

of highly valuable commercial species are attributable to several potential factors including over-fishing. However, it has to be noted that the relative role of over-fishing is not well understood due to the lack of necessary quantitative data. Additionally, by-catch remains a major threat to non-commercial marine species. It has been estimated that around 1300 marine turtles were trapped in shrimp trawl nets during the 1997-8 shrimping season.

Seasonal Camping

Hundreds of local people camp annually during winter at the Sakhir (a dessert area situated at the center of the main island Bahrain). It seems likely that camping activities force increasing stresses on the naturally harsh dessert environment. For instance, campers deliberately clear the vegetation cover at the intended camping site before they stand their tents, which are, in turn, maintained for several months. Illegal municipal solid waste disposal remains a problem despite the installment of garbage bins and the launched awareness programs.

Invasive Alien Species

Invasion of alien species has been recognized by the CBD as one of the greatest threats to the components of biodiversity and the sustainability use of biological resources, particularly in island states such as Bahrain.

As stated earlier, some invasive species have successfully colonized natural habitats in Bahrain. Although their adverse impacts on local biodiversity cannot be currently quantitatively assessed due to insufficient information, their potential threats should not be underestimated. For instance, the invasive Indian house crows *C.splendens* and the brown-necked raven *C.ruficollis* have been reported to attack the nests of indigenous bird species in the northern Bahrain.

5. CURRENT STATUS OF NATIONAL BIODIVERSITY STRATEGIES AND ACTION PLANS

Parties to CBD are all invited to provide an overview of the current status of their National Biodiversity Strategies and Action Plans (NBSAPs) or other programmes and plans developed and adopted to implement the Convention. In so doing, Parties are requested to focus on:

(a) Status of NBSAPs

No NBSAP has been developed in the Kingdom of Bahrain due to financial constrains. A national environment strategy (NES) has been prepared and is under consideration for adoption. The NES includes a chapter about biodiversity which has been prepared taking into account the objectives and the key requirements of the CBD.

(b) If NBSAP has been updated, details on processes followed and changes made;

Not yet applicable.

(c) Priority actions identified in NBSAPs, and to what degree these promote integration of biodiversity concerns across sectors;

Not yet applicable.

(d) Successes and challenges in implementation, lessons learned in developing, implementing and evaluating NBSAPs, and suggested ways and means to further enhance implementation.

Not yet applicable.

6. BIODIVERSITY GOALS AND TARGETS AND THE CONTRIBUTION TO THE IMPLEMENTATION OF CBD

6.1. Progress Towards the 2010 Targets

Parties to the CBD have been invited to evaluate their achievements and report on progress towards the 2010 target, using a provisional framework for goals and targets. For each goal or target of the provisional framework, Parties are invited to describe:

(a) National targets established to achieve these goals;

None have yet been established in Bahrain.

(b) Outcomes or impacts of actions or measures taken to achieve these goals and targets;

Not yet applicable.

Parties are also encouraged to

(a) Use indicators that are nationally relevant as well as those headline indicators adopted by the Conference of the Parties for measuring progress towards the 2010 target;

None have yet been established in Bahrain.

(b) Elaborate wherever relevant on national implementation of various programmes of work and cross-cutting issues adopted under the Convention.

Goal 1. Promote the conservation of the biological diversity of ecosystems, habitats and biomes.

Goal 2. Promote the conservation of species diversity

Goal 3. Promote the conservation of genetic diversity

Goal 4. Promote sustainable use and consumption

Goal 5. Pressures from habitat loss, land use change and degradation, and unsustainable water use, reduced.

Goal 6. Control threats from invasive alien species

Goal 7. Address challenges to biodiversity from climate change, and pollution

Goal 8. Maintain capacity of ecosystems to deliver goods and services and support livelihoods

Goal 9. Maintain socio-cultural diversity of indigenous and local communities

Goal 10. Ensure the fair and equitable sharing of benefits arising out of the use of genetic resources

Goal 11. Parties have improved financial, human, scientific, technical and technological capacity to implement the Convention

Most of these issues have been addressed in Section-4 of the present report.

6.2. Progress Towards the CBD Strategic Plan

The Strategic Plan of the Convention commits Parties to a more effective and coherent implementation of the three objectives of the Convention. In this subsection, Parties are invited to report on progress in meeting the goals and objectives of the Strategic Plans, by focusing on:

(a) National targets established to achieve these goals and objectives, where appropriate;

None have yet been established in Bahrain.

(b) Actions or measures taken to achieve these goals and objectives;

Not yet applicable in Bahrain

(c) Outcomes or impacts of relevant actions or measures taken.

Not yet applicable in Bahrain.

Parties are also encouraged to:

(a) Use indicators that are nationally relevant as well as those headline indicators adopted by the Conference of the Parties for measuring progress towards the goals and objectives of the Strategic Plan of the Convention;

None have yet been established in Bahrain.

(b) Elaborate wherever relevant on national implementation of various programmes of work and cross-cutting issues adopted under the Convention.

Goal 1. The Convention is fulfilling its leadership role in international biodiversity issues.

Goal 2. Parties have improved financial, human, scientific, technical, and technological capacity to implement the Convention.

Goal 3. National biodiversity strategies and action plans and the integration of biodiversity concerns into relevant sectors as an effective framework for the implementation of the objectives of the Convention.

Goal 4. There is a better understanding of the importance of biodiversity and of the Convention, and this has led to broader engagement across society in implementation.

Most of these issues have been addressed in Section-4 of the present report.

6.3. Implications for Updating the National Biodiversity Strategy and Action Plans (NBSAPs)

Parties to the CBD have been invited to consider, in light of their assessment of status and trends of, and threats to, biodiversity and national progress in achieving the 2010 target and the goals and objectives of the Strategic Plan of the Convention, the need to update existing NBSAPs or other biodiversity-related programmes, plans and policies. In doing so, Parties are encouraged to focus on:

(a) Success stories;

Not yet applicable in Bahrain because no NBSAP has been developed and the NES is still under consideration for adoption.

(b) Obstacles encountered in implementation;

Not yet applicable in Bahrain.

(c) Lessons learned in achieving success/overcoming obstacles;

Not yet applicable in Bahrain.

(d) Where obstacles still exist, proposed ways and means of overcoming them.

Not yet applicable in Bahrain.

6.4. Additional Information on National Implementation of the Convention

Parties to the CBD have been requested to provide in narrative format, any information considered necessary to reflect national implementation that is not covered in the requests or questions above. In doing so, Parties are encouraged to focus on:

(a) The implementation of the provisions of the Convention, various programmes of work and cross-cutting issues adopted under the Convention;

Albeit the lack of NBSAP, numerous measures have been undertaken in Bahrain to promote the conservation and sustainable use of the components of biodiversity, which include, inter alias, the following:

- *developing provisional biological inventories, particularly for marine habitats and species*
- *promoting the wise use of the components of biodiversity such as sustainable agriculture, fisheries and herbal medicine*
- *establishing management organizations and allocating human, technical and financial resources for the conservation and sustainable use of biodiversity*
- *developing national legislative framework for the conservation and sustainable use of biodiversity*
- *protecting the components of biodiversity in their natural environment through the designation of one terrestrial and four marine protected areas*
- *adopting measures to protect and to promote the recovery of the populations of threatened species*
- *combating the spread of some invasive alien species*
- *encouraging ex-situ conservation through captive breeding and re-introduction programs of threatened and commercial marine, terrestrial and cultivated species*
- *launching and maintaining continuous public awareness and educational programs*

(b) Outcomes and impacts of measures or actions taken;

Restoration of antelope species and the protection of dugongs and seabirds breeding colonies (see the following question)

(c) Success stories;
The captive breeding and re-introduction programs adopted by Al-Areen Wildlife Park and Reserve have succeeded to restore the populations of some threatened antelope

species, in particular the Arabian sand gazelle and the Arabian Oryx. Strict protection measures in Hawar Islands Protected Area, including public access restriction, have safe-guarded the globally important feeding and breeding grounds of migratory and resident seabirds and protected the second largest herd of dugongs in the world.

(d) Impediments to implementation.

The following impediments (adapted from the standardized list contained in the CBD Strategic Plan) are encountered in the implementation of the CBD in Bahrain:

Political/societal obstacles

- *limited public participation and stakeholder involvement*
- *limited mainstreaming and integration of biodiversity issues into other sectors*

Institutional, technical and capacity-related obstacles

- *insufficient enforcement of domestic environmental legislations*
- *considerable shortage in human resources*
- *insufficient transfer of technology and expertise*
- *insufficient scientific research capacities*
- *limited technical capacities*

Accessible knowledge/information

- *available biodiversity data not fully utilized*
- *lack of a central biodiversity database*
- *insufficient public awareness*

Economic policy and financial resources

- *lack of international financial assistance due to the consideration of Bahrain as illegible for financial funding of the CBD*
- *limited economic incentive measures*
- *insufficient financial contribution of private sector*
- *limited development of ecotourism*

Collaboration/cooperation

- *ineffective partnerships between the governmental and non-governmental stakeholders*

Socio-economic factors

- *increasing pressure from the accelerated population growth*
- *unsustainable consumption and production patterns*
- *limited geographical area of the country resulting in high demand on land for housing, commercial and industrial developments*

ANNEX-I

Standardized Questions for Analytical Purposes

ANNEX-I

Standardized Questions For Analytical Purposes

The following set of standardized questions or tables are developed for analytical purposes. They are also designed to serve as a reminder to Parties in the preparation of the narrative part of the fourth national report. Parties are requested to respond to each applicable question by ticking one or more of the multiple choice responses provided that best reflect national implementation. If none of the choices provided fits national circumstances, Parties should indicate as such and provide further explanation in the box located at the end of the section.

(**Note:** selected options are bolded and additional comments are italic)

I.1. Monitoring and assessment

Standard Question 1. Has your country established monitoring systems at genetic, species and ecosystem levels?

a) No
b) Relevant monitoring systems being established
c) Yes, only at one of the levels (please specify)
d) Yes, at two of the three levels (please specify)
e) Yes, at all three levels

Continuous programs dedicated to the monitoring of the components of biodiversity are limited to selected species, in particular, antelopes and seabirds breeding in Hawar Islands Protected Area. At the ecosystem level, coral reefs, mudflats and mangrove swamps are periodically monitored by immature specialists and academics.

Standard Question 2. Has your country developed the guidelines for environmental impact assessment (EIA) and strategic environmental assessment (SEA) and applied them to plans, programmes and projects that have impacts on biodiversity?

a) No
b) Relevant guidelines under development
c) Yes, EIA guidelines developed and applied (please provide details)
d) Yes, both EIA and SEA guidelines developed and applied

The EIA is mandatory for all developments imposing likely adverse impacts on biodiversity including, in alias, industrial, housing, and resort projects. The EIA legislative framework is governed by provisions of the Ministerial Order (1) 1998 with respect to the Environmental Evaluation of Projects outlining the mechanism and identifying the requirements of the EIA. The national EIA guidelines, which are in

harmony with the relevant international guidelines, have been developed and implemented for large-scale projects. However, due to the present significant shortage in land suitable for urbanization and development, only one project location option is usually investigated in the EIA. Also, Bahrain faces a challenge to ensure the effective implementation of the mitigation/prevention measures recommended in the EIA study.

Standard Question 3. Has your country established proper mechanisms to collaborate with neighboring countries to monitor trans-boundary impacts on biodiversity and develop joint measures to address them?

a) No
b) Relevant mechanisms are being considered and developed
c) Yes, some mechanisms in place

Bahrain has significantly contributed in the regional efforts pertaining to the protection of ROPME Sea Area from trans-boundary pollutants which include developing and implementing a regional contingency plan for combating oil pollution. Bahrain has actively contributed in the development of a regional plan dedicated to the control of invasive alien species released by ballast water in ROPME Sea Area. Co-operation with neighboring countries has, also, successfully established a regional seasonal shrimp closure season in attempt to maintain the regional shrimp stock. A turtle exclusive device has been developed through technical co-operation with the relevant authorities in Saudi Arabia. Exchange of expertise and animals for captive breeding is undertaken at regular basis by Al-Areen Wildlife Park and Reserve.

I.2. Status of NBSAPs

Standard Question 4. Has your country developed a National Biodiversity Strategy?

a) No
b) A strategy is being developed
c) Yes, completed
d) Yes, completed and adopted

If the answer to the above question is no, what biodiversity programmes have been developed to implement the Convention?

No NBSAP has been developed in Bahrain due to financial obstacles. A National Environment Strategy (NES), including two chapters dedicated to biodiversity and marine resources, has been prepared and is under consideration for adoption. The biodiversity chapter has been formulated taking into consideration the objectives and the key requirements of the CBD in attempt to satisfy the obligations of Bahrain towards the convention. One of the key recommendations of the NES is to develop a more comprehensive NBSAP

Standard Question 6. Has your country developed a plan of action for biodiversity?

a) No
b) An action plan is being developed
c) Yes, completed – but not adopted
d) Yes, completed and adopted

The national environment action plan, dedicated to the implementation of the proposed NES, is being under consideration. It shall be prepared and implemented shortly following the adoption of the NES.

Standard Question 7. If the answer to the above question is no, what plan or programme has your country developed and adopted to implement your national biodiversity strategy or other relevant programmes?

Not applicable.

Standard Question 8. Has your country updated its national biodiversity strategy and/or action plan in light of developments under the Convention and at the national level?

a) No
b) NBSAP is being updated
c) Yes, updated

Not applicable for Bahrain as the NBSAP has not been yet developed. The NES has been prepared but is still under consideration for adoption.

Standard Question 9. Has your country identified priority actions for its national biodiversity strategy and/or action plan?

a) No
b) Priority actions are being identified – but are not yet funded
c) Some priority actions have been identified
Please provide a list of priority actions identified

National priority actions pertaining to the biodiversity sector will be identified during the preparation of the national environment action plan.

Standard Question 10. Has your country established adequate capacity for implementation of priority actions in its national biodiversity strategy and action plan?

a) No

b) Relevant plans and programmes under development
c) Yes, capacities established for some priority actions
d) Yes, capacities established for most priority actions

Not applicable; the priority actions have not yet been identified.

Standard Question 11. Is your country actively implementing the priorities in national biodiversity strategies and action plans as a means to achieve national implementation of the Convention?

a) No
b) Priority actions are being identified
c) Yes, some priority actions being implemented
d) Yes, most priority actions being implemented

Not applicable; the priority actions have not yet been identified.

Standard Question 12. Has your country assessed the obstacles to implementation of its national biodiversity strategy and/or action plan?

a) No
b) Assessment is under way
c) Yes
Please provide a list of obstacles identified

Not applicable; NES has not been yet implemented.

Standard Question 13. Has your country integrated biodiversity concerns into relevant national sectoral and cross-sectoral plans, programmes and policies?

a) No
b) Integration under way
c) Yes, into some sectors
d) Yes, into most sectors

The needs of the conservation and sustainable use of biodiversity have been incorporated into some sectors including, inter alias, the agriculture, fisheries, tourism and housing. It is worth mentioning that a key objective of the intended NES is to promote the incorporation of the environmental protection requirements, including the conservation and sustainable use of biodiversity, into national sectoral and cross-sectoral programs, plans and policies.

Standard Question 14. Are your national biodiversity strategies and action plans (including updated NBSAPs) or other programmes and plans developed or adopted for the implementation of the Convention available on the Internet?

a) No
b) Relevant documents or website addresses have been submitted to the Secretariat
c) Yes (please provide details below)
Please provide website addresses

Not applicable; the NBSAP has not been yet adopted.

I.3. Progress towards the 2010 target

Parties are encouraged to develop national targets in response to a provisional framework of goals and targets for the 2010 target adopted in decision VII/30. Before responding to questions below, please provide in the following table an overview of development of national targets, degree of integration of global targets into national strategies and plans and development of relevant indicators.

No national targets or indicators have been developed in Bahrain because the NES is still under consideration.

Goal 1. Promote the conservation of the biological diversity of ecosystems, habitats and biomes.

Standard Question 15. Has your country established a system of protected areas of various types to protect areas of particular importance to biodiversity and contribute to the conservation of the world's ecological regions?

a) No
b) Relevant plans or programmes are under development
c) Yes, a system is in place but not adequate for conservation objectives
d) Yes, an adequate system is in place

At present, there are one terrestrial and four marine declared protected areas in Bahrain. Hawar Islands Protected Area is particularly significant at international level. The archipelago provides valuable foraging and breeding grounds for seabirds, marine turtles and dugongs The breeding colony of the Socotra cormorant Phalacrocorus nigrogularis on Hawar Islands is the largest in the world, and the sea-cow Dugong dugon population around the archipelago represents the second largest herd after Australia. For those reason, strict conservation measures promoting the conservation and sustainable use of the components of biodiversity are enforced on Hawar Islands.

Goal 2. Promote the conservation of species diversity

Standard Question 16. Has your country taken measures to restore, maintain or reduce the decline of populations of species of selected taxonomy groups?

a) No
b) Relevant measures are being developed
c) Yes, some measures in place
d) Yes, comprehensive measures in place

Standard Question 17. Has your country taken measures to improve the status of threatened species?

a) No
b) Some measures are being developed
c) Yes, some measures in place
d) Yes, comprehensive measures in place

The captive breeding and re-introduction programs adopted by Al-Areen Wildlife Park and Reserve have resulted in successful restoration of the Arabian sand gazelle and Arabian Oryx, which are currently maintained and continuously monitored in the wilderness. Dugongs inhabiting the territorial waters of Bahrain are under full protection and it seems unlikely that they are threatened at the national level.

Goal 3. Promote the conservation of genetic diversity

Standard Question 18. Has your country taken measures to conserve genetic diversity of crops, livestock, harvested species of trees, fish, wildlife and other valuable species, as well as maintain associated indigenous and local knowledge?

a) No
b) Relevant measures are being developed
c) Yes, some measures in place
d) Yes, comprehensive measures in place

Goal 4. Promote sustainable use and consumption

Standard Question 19. Has your country taken any measures to ensure that biodiversity-related products are derived from sources that are sustainably managed and production areas are managed consistent with the conservation of biodiversity?

a) No
b) Relevant measures are being developed
c) Yes, some measures in place
d) Yes, comprehensive measures in place

Standard Question 20. Has your country taken measures to reduce unsustainable consumption of biological resources?

a) No
b) Relevant measures under development
c) Yes, some measures in place
d) Yes, comprehensive measures in place

Shrimping is annually band during the breeding season to promote recruitment of juveniles in attempt to sustainably maintain the regional stock of commercial shrimp. Destructive fishing gears, such as explosions, poisons and polythene nets, are prohibited and industrial fishing has been totally band in Bahrain.

Standard Question 21. Has your country taken measures to avoid or minimize negative impacts of international trade on species of wild flora or fauna?

a) No
b) Relevant measures are being considered
c) Yes, some measures in place
d) Yes, comprehensive measures in place

Bahrain is investigating the adoption of the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES). Meanwhile, also, the illegal import and cross-boundary transfer of threatened species, particularly falcons, are strictly regulated in Bahrain.

Goal 5. Pressures from habitat loss, land use change and degradation, and unsustainable water use, reduced.

Standard Question 22. Has your country taken measures to decrease the rate of loss and degradation of natural habitats?

a) No
b) Some measures are being considered
c) Yes, some measures in place
d) Yes, comprehensive measures in place

Goal 6. Control threats from invasive alien species.

Standard Question 23. Has your country taken measures to control pathways for major potential alien invasive species?

a) No
b) Relevant measures are being developed
c) Yes, some measures in place
d) Yes, comprehensive measures in place

With active contribution from Bahrain, a regional action plan dedicated to the control of invasive species released via ballast water in ROPME Sea Area is under consideration.

Standard Question 24. Has your country put in place management plans for major alien species that threaten ecosystems, habitats or species?

a) No
b) Relevant plans under development
c) Yes, relevant plans in place
d) Yes, reports on implementation of relevant plans available

Measures have been taken by Al-Areen Wildlife Park and Reserve to control the spread of the Indian house crow Corvus splendens and the brown-necked raven Corvus ruficollis. These invasive bird species have successfully colonized the northern Bahrain, and have been reported to attack the nests of indigenous bird species.

Goal 7. Address challenges to biodiversity from climate change, and pollution

Standard Question 25. Has your country taken measures to maintain and enhance resilience of the components of biodiversity to adapt to climate change?

a) No
b) Relevant measures are being considered
c) Yes, some measures in place

Bahrain is a party to the United Nation Framework Convention on Climate Change. A preliminary study investigating the likely impacts of climate change on marine and coastal habitats has been prepared.

Standard Question 26. Has your country taken measures to reduce pollution and its impacts on biodiversity?

a) No
b) Relevant measures are being developed
c) Yes, some measures in place
d) Yes, comprehensive measures in place

Point pollution sources (including industrial and wastewater discharges into the marine environment) are continuously managed and monitored at a regular basis. The quality of ambient seawater and the community structure of faunal benthic assemblages nearby industrial and desalination plant's outlets are seasonally monitored. Hazardous wastes are properly treated and, subsequently, disposed in environmentally sound manners. National and regional contingency plans for combating oil pollution are maintained.

Goal 8. Maintain capacity of ecosystems to deliver goods and services and support livelihoods

Standard Question 27. Has your country taken any measures to maintain capacity of ecosystems to deliver goods and services?

a) No
b) Some measures are being considered
c) Yes, some measures taken
d) Yes, major measures taken

Standard Question 28. Has your country taken measures to maintain biological resources that support sustainable livelihoods, local food security and health care?

a) No
b) Some measures are being developed
c) Yes, some measures in place
d) Yes, comprehensive measures in place

The national legislations mandate farmers to ensure that date palms are adequately maintained. It is also prohibited to take off date palms unless it is intended for proliferation purposes.

Goal 9 Maintain socio-cultural diversity of indigenous and local communities

Standard Question 29. Has your country taken measures to protect traditional knowledge, innovations and practices, including the rights of indigenous and local communities over their traditional knowledge, innovations and practices and to benefit sharing?

a) No
b) Not applicable
c) Some measures are being developed
d) Yes, some measures in place

Concerns have increased to protect and maintain the traditional knowledge and practices pertaining to the sustainable use of the components of biodiversity in Bahrain such as those associated with fishing, pearl diving and date palms. For instance, fishing by the traditional wire (gargoor) and barrier (hadra) traps are exceptionally permitted in Hawar Islands for this purpose.

Goal 10. Ensure the fair and equitable sharing of benefits arising out of the use of genetic resources

Standard Question 30. Has your country developed any legislations or mechanisms or measures to ensure that all transfers of genetic resources are in line with the Convention on Biological Diversity, the International Treaty on Plant Genetic Resources for Food and Agriculture and other applicable agreements?

a) No
b) Relevant legislations, mechanisms or measures are being considered
c) Yes, some legislations, mechanisms or measures in place
d) Yes, comprehensive legislations, mechanisms or measures in place

Standard Question 31. Has your country developed any mechanisms for sharing benefits arising from the commercial and other utilization of genetic resources with the countries providing such resources?

a) No
b) Some mechanisms are being developed
c) Yes, some mechanisms in place

Goal 11. Parties have improved financial, human, scientific, technical and technological capacity to implement the Convention.

The following two questions (nos. 32 and 33) are for DEVELOPED COUNTRIES only.

Standard Question 32. Has your country provided new and additional financial resources to developing countries to allow for the effective implementation of their commitments under the Convention?

a) No
b) Relevant budgets or programmes are being considered
c) Yes, some channels and programmes developed for this purpose
d) Yes, many channels and programmes developed for this purpose

Not applicable to Bahrain

Standard Question 33. Has your country developed any mechanisms or measures to transfer technology to developing countries to allow for the effective implementation of their commitments under the Convention?

a) No
b) Relevant mechanisms or measures are being developed
c) Yes, some mechanisms or measures in place
d) Yes, comprehensive mechanisms or measures in place

Not applicable to Bahrain

I.4. Strategic Plan of the Convention

Standard Question 34. Is your country promoting the integration of biodiversity concerns into sectoral or cross-sectoral plans, programmes and policies at the regional and global levels?

a) No
b) Relevant mechanisms are being considered
c) Yes, in some sectors
d) Yes, in major sectors

Standard Question 35. Is your country promoting collaboration at the regional and subregional levels to implement the Convention?

a) No
b) Relevant mechanisms are being developed
c) Yes, some mechanisms established
d) Yes, reports on such collaboration available

This is largely because of the lack of NBSAP.

Goal 2. Parties have improved financial, human, scientific, technical, and technological capacity to implement the Convention

Standard Question 36. Is your country promoting scientific and technical cooperation to contribute to capacity building?

a) No
b) Relevant programmes under development
c) Yes, in some areas
d) Yes, in many areas

Bahrain is actively co-operating with other members of the Gulf Cooperation Council (GCC) and ROPME through developing regional training programs and exchanging expertise.

The following two questions (nos. 37 and 38) are for DEVELOPING COUNTRIES only.

Standard Question 37. Has your country provided sufficient resources to implement the three objectives of the Convention?

a) No
b) Relevant budgetary sources are being considered
c) Yes, limited resources provided
d) Yes, adequate resources provided

Standard Question 38. Has your country received resources from external sources to support the implementation of the Convention?

a) No
b) Yes, extremely limited resources received
c) Yes, limited resources received
d) Yes, adequate resources received

The first national report to the CBD has been developed with technical assistance of the UNDP.

Goal 3. National biodiversity strategies and action plans and the integration of biodiversity concerns into relevant sectors as an effective framework for the implementation of the objectives of the Convention.

Goal 4. There is a better understanding of the importance of biodiversity and of the Convention, and this has led to broader engagement across society in implementation.

Standard Question 39. Is your country implementing a CEPA strategy and promoting public participation in support of the Convention?

a) No
b) Relevant strategy and programmes under development
c) Yes, some programmes and activities being implemented
d) Yes, comprehensive programmes and activities being implemented

Standard Question 40. Has your country taken measures to effectively involve indigenous and local communities in the implementation of the Convention and in the processes of the Convention at national, regional and international levels?

a) No
b) Relevant mechanisms are being considered
c) Yes, in some areas
d) Yes, in most areas

Representatives of local municipal councils are consulted during the EIA studies of large-scale projects likely to impose adverse impacts on biodiversity. Non-governmental organizations were important partners during the preparation of the NES.

Standard Question 41. Is your country engaging key actors and stakeholders in partnerships to implement the Convention?

a) No
b) Relevant mechanisms are being developed
c) Yes, to a limited extent
d) Yes, to a significant extent

If none of the responses provided to some questions above fits your national circumstances please provide further explanations in the box below.

ANNEX-II

Selected Environmental Legislations

ANNEX-II

Selected Environmental Legislations

The legislative biodiversity framework in Bahrain is based on a range of national laws as well as regional and international agreements. This annex presents some of the national laws (Table II.1) and multi-lateral agreements (Table II.2) pertaining to the environmental protection in Bahrain with particular reference to the conservation of biodiversity.

Table II.1. Selected national environmental legislations in Bahrain.

Legislation	Overview
Decree (2) 1995 with respect to the Protection of Wildlife, and its amendments	outlines the overall framework of the national policy for the conservation of wildlife forcing legislative regulations and identifying the responsibilities of the competent authority
Decree (21) 1996 with respect to the Environment, and its amendments	establishes the overall framework of the environmental policy in Bahrain setting legislative regulations and identifying the responsibilities of the competent authority
Decree (20) 2002 with respect to the Regulation of Fishing and Exploitation of Marine Resources	outlines the overall legislative framework regulating the exploitation of fisheries and other marine resources and identifies the responsibilities of the competent authority
Ministerial Order (1) 1998 with respect to the Environmental Evaluation of Projects	outlines the scope and mechanism of the Environmental Impact Assessment (EIA) and lists the categories of developments that should be compulsorily subject to EIA
Ministerial Order (10) 1999 with respect to the Environmental Standards (Air and Water), and its amendments	lists the national environmental standards for the quality of ambient in addition to air emissions and industrial effluent
Ministerial Order (4) 2000 with respect to the Permission of Dredging of Marine Sand	details the mechanism and identifies the requirements of marine dredging applications
Ministerial Order (4) 2000 with respect to the Permission of Infilling Submerged	outlines the mechanism and identifies the requirements of marine infilling

Legislation	Overview
Marine Lands	applications
Ministerial Order (1) 1995 with respect to the Band of Infilling and Urbanization in Tubli Bay.	bands the reclamation and urbanization developments in Tubli Bay
Prime Minister Order (16) 1996 with respect to the Declaration of Hawar Islands and its Territorial Waters as a Protected Area	declares Hawar Islands and its territorial waters as a protected area, in accordance to Decree (2) 1995 with respect to the Protection of Wildlife
Ministerial Order (1) 2002 with respect to the Declaration of Mashtan Island as a Protected Area	declares Mashtan Island as a Protected Area in accordance to Decree (2) 1995 with respect to the Protection of Wildlife
Ministerial Order (4) 2003 with respect to the Declaration of Dowhat Araad as a Marine Natural Protected Area	declares Dowhat Araad as a Marine Protected Area
Ministerial Order (3) 2003 with respect to the Prohibition of Hunting all Species of Sea-Cows, Marine Turtles and Dolphins	protects all species of sea-cows, turtles and dolphins in the territorial waters of Bahrain from fishing activities
Ministerial Order (10) 1998 with respect to the Fees of Permissions and Services Provided by Environmental Affairs	identifies the fees of the permissions and services provided by the environmental organization in Bahrain
Ministerial Order (10) 1998 with respect to the Control of Ozone Layer Depleting Substances	outlines the regulations imposed by Bahrain regarding the protection of the ozone layer from depleting substances
Ministerial Order (10) 1998 with respect to the Permission of Maintenance of Equipment and Buildings containing Asbestos, and the Disposal, Transfer and Treatment of Associated Wastes	sets the environmental regulations adopted by Bahrain regarding the disposal, handling, and treatment of Asbestos
Ministerial Order (3) 2000 with respect to the Procedures of the Environmental Inspection	establishes the procedures and requirements of the environmental inspection, and listing the responsibilities of the environmental inspectors
Ministerial Order (3) 2000 with respect to the Registration of Environmental Consultants Conducting Environmental	lists the criteria of the registration and the responsibilities of the environmental consultants

Legislation	Overview
Impact Assessment of Projects and Environmental Studies	
Ministerial Order (1) 2000 with respect to the Management of Medical Hazardous Wastes	sets the regulations of the handling, transfer and treatment of medical hazardous wastes in Bahrain
Ministerial Order (7) 2002 with respect to the Control of the Import and Usage of Banned and Restricted Chemicals	lists the regulations pertaining to the import and usage of banned and restricted chemicals

Table II.2. Selected regional and international conventions acceded/ratified by Bahrain.

Convention	Status of Bahrain	Progress of Implementation
Convention on Biological Diversity	Ratified on 30 August 2003	No valuable progress has been achieved mainly due to financial restrictions
Wetlands of International Importance Especially as Waterfowls Habitat (RAMSAR, 1971)	Acceded in 1997	No valuable progress has been achieved mainly due to financial restrictions
United Nation Framework Convention on Climate Change	Ratified on 28th December 1994	Bahrain has implemented an enabling project with the financial support of GEF
Vienna Convention for the Protection of Ozone Layer	Acceded on 27th April 1990 and ratified London, Montreal and Copenhagen	Good progress has been attained; in 2002 the Ozone Unit in Bahrain was considered by UNEP one of the best three unites in the world
Basel Convention On the Control of Trans-boundary Movements of Hazardous Wastes and Their Disposal	Ratified in 1992	Many regulations have been adopted by Bahrain regarding the control of hazardous wastes
International Convention on Civil Liability for Oil Pollution Damage (CLC), 1969	Acceded on 9th August 1995	Capacity building with respect to the implementation of the convention has been relatively achieved and the convention was applied on one case in 1997.
International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage	Acceded on 9th August 1995	-
Kuwait Regional Convention for Cooperation on the Protection of the Marine Environment from Pollution.	Ratified in 1978	Bahrain is an active member in ROPME, and has considerably contributed in the relevant regional efforts
Convention on the	Ratified in 2002	-

Convention	Status of Bahrain	Progress of Implementation
Establishment of a Regional Commission for Fishing Grounds		
Convention on the Conservation of Wildlife and Natural Habitats in GCC Countries	Ratified in 2002	-
Tockholm Convention on Persistent Organic Pollutants (POPs)	Signed in 2002	-

ANNEX-III

Overview of the Biodiversity Chapter of the Draft National Environment Strategy

ANNEX-III

Overview of the Biodiversity Chapter of the Draft National Environment Strategy

With financial and technical support from the UNDP, the National Environment Strategy (NES) has been developed in Bahrain, and is under consideration for adoption by the relevant national authorities. The draft strategy includes a chapter dedicated to biodiversity which has been intentionally prepared taking into account the objectives and the key requirements of the CBD in attempt to satisfy the obligations of Bahrain towards the convention. The biodiversity chapter consists of five major sections entitled: (i) introduction, (ii) biodiversity, (iii) biodiversity in Bahrain, (v) institutional capacities and (vi) future vision, which are summarized below:

III.1. Introduction

This section rationalizes the need of adopting a national strategy and an action plan for the conservation of the components of biodiversity in Bahrain.

III.2. Biodiversity

This section defines the "biodiversity", addresses its importance and overviews the historical background as well as the key objectives of the CBD.

III.3. Current Status of Biodiversity in Bahrain

The variety of natural habitats and species are described, and the key anthropogenic impacts threatening the components of biodiversity in Bahrain are identified.

III.4. Institutional Capacities

In general, this section outlines the major institutional capacity contributing to the conservation and sustainable use of biodiversity in Bahrain.

III.5. Future Vision

This section lays down the key long-term objectives pertaining to the conservation and sustainable use of the components of biodiversity in Bahrain:

- To prepare the National Biodiversity Strategy and Action Plan (NBSAP) and to establish a national biodiversity committee (chaired by the Public Commission for the Protection of Marine Resources, Environment and Wildlife and comprised

from all relevant stakeholder) that should be obliged to prepare and implement the proposed NBSAP.

- To strengthen co-operation with concerned regional and international bodies taking into consideration the commitments and guidance of regional and international legislations with particular reference to the Convention on Biological Diversity, Kuwait Regional Convention for Co-operation on the Protection of the Marine Environment From Pollution as well as the Protocol concerning the Conservation of Biological Diversity and the Establishment of Protected Areas in ROPME Sea Area. The aspects of co-operation should include, inter alias, the establishment of regional and international networks promoting the flow of information in addition to adopting effective contingency plans to conserve biodiversity, particularly those relative to protected areas and invasive alien species.

- Developing a plan to sustainably conserve natural habitats from non-wise uses taking into account the increasing demands of other sectors. This may be achieved through conducting extensive ecological baseline surveys, undertaking continuous monitoring programs and adopting effective rehabilitation activities to restore damaged habitats, in particular coastal biotopes and date palm farms.

- To enforce effective measures endorsing the sustainable conservation of the wild and cultivated plant cover from environmental deterioration while considering the demands of other sectors (e.g. housing and agriculture), as well as to restore damaged areas and to sustainably exploit valuable floral resources, especially medicinal plants.

- To restore endangered species via conducting scientific researches identifying the likely threatened taxa (particularly the endemic ones) and the stresses threatening their sustainability and, subsequently, implementing effective measures that prevent further deterioration and restore their populations by means of in- and ex-situ breeding programs, and to contribute in the international efforts regarding the conservation of threatened species.

- To adopt a comprehensive plan intended to combat the spread of invasive alien species in the local habitats by conducting scientific researches identifying likely invasive taxa and assessing their potential damages on local biodiversity, and, subsequently, enforcing strict legislative and administrative regulations on the import and handling of alien species in the local markets, and to contribute in the relevant regional and international efforts.

- To conduct large-scaled continuous monitoring programs identifying the components of local biodiversity and evaluating their current status, as well as recognizing the stresses threatening their continuous viability.

- To expand the scale of the captive breeding programs currently being undertaken by the Al-Areen Wildlife Park and the National Center for Marine Aquaculture

and to encourage the tissue culture technology (particularly for palm palms) by means of allocating the necessary financial resources and enhancing the human and technical capabilities.

- To establish gene banks for wild and cultivated/domestic floral and faunal species (particularly for economically-important wild plants) and to periodically evaluate the environmental and economic feasibility of such projects.

- To conduct extensive scientific researches pertaining to biodiversity (especially those intended to identify and monitor threatened and potentially economically important species as well as invasive taxa) and to strengthen the institutional capacity of concerned national academic and research institutions by means of developing human and technical resources, and to establish a central biodiversity database including all biodiversity information and to link it with relevant regional and international networks.

- To increase the human resources allocated for the biodiversity sector and to establish and maintain training programs developing specialized human capabilities paying particular attention to those pertaining to taxonomy, monitoring, rehabilitation, legislations, management of protected areas and exchange of information, and to enhance those capabilities by expertise exchange with concerned regional and international parties.

- To develop the biodiversity technical capabilities through allocating the necessary financial resources to concerned national organizations and supporting their efforts to acquire and utilize modern equipment and techniques in the identification, monitoring and restoration of biodiversity as well as information technology (particularly the Geographical Information System) and to ensure integrated technical co-operation among those organizations.

- To raise the financial resources allocated to the biodiversity sector, and to diversify the sources of income through encouraging the private sector to contribute in the conservation and sustainable use of biodiversity, enforcing the pollutant-pays principle, and allocating part of the eco-tourism's returns to meet the financial demands of the biodiversity sector.

- To enforce and periodically update national legislations aiming to conserve and to promote the sustainable use of biodiversity paying special attention to threatened species, over-fishing as well as protected areas, and to develop the human resources involved in the monitoring of the enforcement of those legislations.

- To meet the obligations of Bahrain towards the signed/accessed/ratified biodiversity international legislations (in particular the Convention on Biological Diversity) and to investigate the feasibility of ratifying other relevant legislations such as the Convention on Migratory Species of Wild Animals and the Convention on International Trade in Wild Animals and Plants as well as Cartagena Protocol on Biosafety.

- To expand the spatial scale and to establish a national integrated network of protected areas taking into account the needs of other sectors, and to develop and maintain comprehensive plans for the effective management of these areas through preparing national guidelines for the identification, prioritization, and categorization of the protected areas, adopting continuous identification and monitoring programs in addition to imposing strict controls on likely human-induced stresses on biodiversity.

- To prepare a national urbanization strategy ensuring the incorporation of the needs of conserving biodiversity into the initial phases of physical planning, and to impose strict regulations on the non-sustainable urbanization activities (including the band of development in biologically sensitive areas) with a trend to expand the environmental compensation and to employ modern technology in an attempt to mitigate the potential adverse impacts of dredging and reclamation operations on biodiversity.

- To adopt programs promoting the protection of biodiversity from environmental pollution, and enforcing effective measures to combat all forms of pollution (inter alias, oil pollution, industrial and wastewater discharges, pesticides and solid waste) and to implement the relevant national and regional contingency plans in conjugation with raising public awareness about the influences of pollution on biodiversity.

- To protect wildlife from hunting through developing legislations imposing tight restrictions on all sorts of non-sustainable hunting of animals in the sea and on the land, and banding the commercial handling of wild animals, particularly endangered species.

- To endorse ecotourism as a potentially valuable sustainable use of the biodiversity components after implementing strict regulations mitigating its likely adverse influences on various forms of life which may inter alias include the adoption of continuous control and monitoring programs.

- To raise public (including decision makers) awareness regarding the importance and benefits of the conservation and the sustainable use of biodiversity, and to involve the public (particularly local people and NGOs) as key counterparts in the programs aiming to conserve biodiversity. This may include incorporating the requirements of protecting biodiversity within the national educational curricula through close co-operation with the Ministry of Education.

- To protect the national heritage associated with biodiversity, such as that pertaining to pearl diving, freshwater springs and palm palms paying special regards to protecting the sustainable traditional agricultural and fishing methods by means of developing and maintaining appropriate legislations and awareness programs.

- To evaluate the national strategies and action plans of the agricultural and fisheries sectors in attempt to assure the sustainability of the exploited resources, and to promote the conservation of non-target species from non-wise activities.

ANNEX-IV

Provisional Species Lists of Bahrain

ANNEX-IV

Provisional Species Lists of Bahrain

The following species lists were developed in December 2005 based on preliminary assessment of available taxonomic literatures. It remains provisional since there are still many gaps in major taxa and, also, the list includes only the species which have been confidentially identified by specialists. While terrestrial plants and large animals have been extensively inventoried, it is expected that additional discoveries are almost certainly possible among insects, fishes and benthic invertebrates.

IV.1. Algae

Scientific Name
Acanthophora spicifera
Anotrichium tenue
Avrainvilla sp
Caulerpa srtularioides
Caulerpa serularioies
Chaetomorpha capillaris
Chondria dasyphylla
Crouania attenuata
Cystoseira myrica
Dictyosphaeria cavernosa
Dictyota divaricata
Digenea simplex
Enteromorpha intesinalis
Grouania attenuata
Herposiphonia secunda
Hormophysa triquetra
Hypnea cornuta
Hypnea valentiae
Jania rubens
Laurancia sp.
Laurencia papillosa

Scientific Name
Laurencia glandulifera
Mamly capitellidae
Ophionereis dutria
Padina gymnospora
Polysiphonia sp2
Polysiphonia kampsaxii Borgsen
Polysiphonia ptuticorinensis
Polysiphonia crassicollis
Sargassum boveanomvar aterrimum
Sargassum heteromorphum
Spyridia llamentosa
Thyroscyphus fruticosus
Ulva lactuca

IV.2. Vascular Plants

Scientific Name	Common Name
Acacia arabica	
Acacia sp.	
Acacia tortilis(raddiana)	
Adiantum capillus-veneris	
Aeluropus lagopoides	Aeluropus
Aeluropus littoralis	
Aerva javanica	Aerva
Aizoon canariense	Purslane-leaved aizoon
Aizoon hispanicum	
Alhagi maurorum	Camel thorn
Alternanthera sessilis	
Amaranthus graecizans	
Amaranthus viridis	

Scientific Name	Common Name
Anabasis articulata	Jointed anabasis
Anabasis setifera	
Anagallis arvensis subsp. Arvensis	Scarlet pimpernel, Cat's eye
Anagallis arvensis subsp. caerula	Blue pimpernel, Cat's eye
Anastatica hierochuntica	Hand of Mary, Hand of the vitgin, Rose of Jericho
Andrachne telephioides	Andrachne
Anethum graveolens	
Antirrhinum orontium	
Apium graveolens	
Aristida abnormis	
Aristida adscensionis	
Arnebia decumbens	Arabian primrose
Arnebia hispidissima	Prophet flower
Arnebia linearifolia	
Arthrocnemum macrostachyum	
Arthrocnemum salicornicum	
Asphodelus tenuifolius	Asphodel
Asphodelus viscidulus	
Aster squamatus	
Astragalus annularis	Birde's fingers
Astragalus corrugatus	Earring Vetch
Astragalus hamrinensis	
Astragalus hauarensis	
Astragalus schimperi	
Astragalus tenuirugis	
Astragalus tribuloides	
Atracrylis flava	Distaff thistle
Atriplex halimus	
Atriplex leucoclada	Orache
Avena sative	

Scientific Name	Common Name
Avicennia marina	Black mangrove, Dwarf mangrove
Bacopa monnieri	
Bassia eriophora	
Bassia muricata	
Beta vulgaris	
Bienertia cycloptera	
Brachypodium distachyom	
Brassica tournefortii	
Bupleurum semicompositum	
Calendula aegyptiaca	
Calendula arvensis	Field marigold
Calendula micrantha	
Calligonum comosum	
Calligonum polygonoides	Red lantern
Calotropis procera	Sodom's apple
Capparis spinosa	Caper plant
Cassia italica	Mecca senna
Cenchrus ciliaris	Foxtail grass, Buffel grass
Cenchrus echinatus	
Centaurium pulchellum	Centaury
Centropodia forskalii	
Chenopodium glaucum	
Chenopodium murale	Nettle-leaved goosefoot
Chloris barbata	Finger grass
Chloris gayana	
Chrysopogon aucheri	
Chrysopogon gayana	
Chrysopogon plumulosus	
Chrysopogon sp.	
Cistanche phelypaea	

Scientific Name	Common Name
Cistanche tubulosa	Desert hyacinth
Citrullus colocynthis	Desert sqaush
Cleome cf quinquenervia	
Cleome noeana	
Convolvulus arvensis	Morning glory, Field bindweed
Convolvulus cantabrica	
Convolvulus deserti	
Convolvulus fatmensis	
Convolvulus lanatus	
Convolvulus pilosellifolius	Morning glory, Bindweed
Convolvulus prostratus	
Convolvulus sp.	
Corchorus depressus	Dwarf jute
cornulaca aucheri	
Cornulaca leucacantha	
Cornulaca monacantha	
Cressa cretica	Alkali weed
Cuscuta campestris	
Cuscuta planiflora	Dodder
Cutandia dichotoma	
Cutandia memphitica	Cutandia
Cymbopogon commutatus	
Cymbopogon jwarancusa	
Cymbopogon schoenanthus	Lemon grass, Camal's hay
Cynodon dactylon	Bermuda grass
Cynomorium coccineum	Red thumb, Desert thumb
Cyperus arenarius	Dwarf sedge
Cyperus conglomeratus	Cyperus
Cyperus laevigatus	
Cyperus rotundus	

Scientific Name	Common Name
Dactyloctenium aegyptuim	Crowfoot grass
Dactyloctenium scindicum	
Datura fastuosa	Thorn apple, Trumpet flower
Dichanthium annulatum	
Dichanthium foveolatum	
Digitaria ciliaris	
Digitaria sanguinalis	
Dipcadi erythraeum	Brown bell, Brown lily
Dipcadi susianum	
Dipcadi unicolor	
Diplanthera uninervis	
Diplotaxis harra	
Echinochloa colona	
Echiochilon kotschyi	Stoneseed
Eclipta alba	
Eleusine compressa	
Eleusine coracana	
Emex spinosus	Prickly dock, Old woman's tooth
Ephedra foliata	Shrubby horsetail
Eremopogon foveolatus	
Erodium glaucophyllum	Glaucus-leaved cranesbill
Erodium laciniatum	Cut-leaved cranesbill
Erodium oxyrrhynchum	
Eruca sativa	
Erucaria hispanica	Pink mustard
Euphorbia densa	Dense spurge
Euphorbia granulata	
Euphorbia peplus	
Euphorbia serpens	
Fagonia bruguieri	

Scientific Name	Common Name
Fagonia indica	Fagonia
Fagonia kahirina	
Fagonia ovalifolia	
Farsetia heliophila	Farsetia
Filago cf desertorum	
Filago spathulata	Cotton rose
Fimbristylis ferruginea	
Fimbristylis sieberana	
Flaveria trinervia	
Frankcoeuria crispa	
Frankenia pulverulenta	Dusty sea heath
Gaillonia calycoptera	Gaillonia
Gaillonia crucianellioides	
Gaillonia sp.	
Gastrocotyle hispida	Hairy bugloss, Hispid anchusa
Glossonema edule	
Glossonema varians	Glossonema
Halocnemum strobilaceum	Jointed glasswort
Halodule wrightii	
Halopeplis amplexicaulis	
Halopeplis perfoliata	String of beads
Halophila ovalis	
Halophila stipulacea	
Halopyrum mucronatum	
Haloxylon persicum	
Haloxylon salicrnicum	Hammada
Haplophyllum sp.	
Haplophyllum tuberculatum	
Helianthemum kahiricum	Sun rose
Helianthemum ledifolium	
Helianthemum lippii	Sun rose

Scientific Name	Common Name
Helianthemum salicifolium	
Heliotropium crispum	Heliotrope, Turnsole
Heliotropium curassavicum	Heliotrope, Turnsole
Heliotropium europaeum	European heliotrope, European trunsole
Heliotropium kotschyi	Heliotrope, Turnsole
Heliotropium ramosissimum	
Herniaria cinerea	
Herniaria hemistemon	Rupturewort
Herniaria hirsuta	
Herpestis monniera	
Hippocrepis bicontorta	Horseshoe vetch
Hippocrepis unisiliquosa	
Hordeum murinum subsp. glaucum	Wall barley
Hordeum vulgare	
Hyparrhenia hirta	Blue-stem grass
Hypecoum pendulum	Hypecoum
Ifloga spicata	Ifloga
Imperata cylindrica	
Jucncus acutus	
Jucncus maritimus	
Jucncus rigidus	Hard sea rush
Koeleria phleoides	
Koelpinia linearis	Goat's beard
Lactuca serriola	
Lasiurus scindicus	
Launaea capitata	
Launaea cassiniana	Launaea
Launaea fragiles	
Launaea mucronata	Mucronate launaea
Launaea nudicaulis	Naked lauaea
Launaea procumbens	Procumbent launaea

Scientific Name	Common Name
Leptadenia pyrotechnica	Desert broom, Broom bush
Limonium axillare	Sea lavender
Linum strictum	
Lippia nodiflora	Creeping varvain
Lithospermum incrassatum	
Loeflingia hispanica	
Lolium perenne	
Lolium rigidum	
Lotus garcinii	
Lotus glinoides	
Lotus halophilus	Birde's - foot trefoil, Gazelle's horn
Lycium shawii	Desert thorn
Malva aegyptia	
Malva parviflora	Small-flowered mallow, Cheeseweed
Matricaria auriculata	
Medicago laciniata	Cut-leaves medick
Melilotus alba	
Melilotus indica	Indian melilot, Sweet clover
Mesembryanthemum forsskalei	Forskal fig marigold
Mesembryanthemum nodiflorum	Egyptian fig marigold
Misopates orontium	
Moltkiopsis ciliata	Callous-leaved gromwell, Stoneseed
Monosonia nivea	Monosonia
Morettia parviflora	
Neurada procumbens	Creeping thorn rose
Ochradenus baccatus	Pearl plant
Ochthochloa compressa	
Ogastemma pusillum	
Oligomeris linifolia	Narrow-leaved oligomeris
Oligomeris subulata	

Scientific Name	Common Name
Ononis reclinata	
Ononis serrata	Serrate-leaves restharrow
Ononis serreclinata	
Ophioglossum aitchisoni	
Orobanche cernua	
Orobanche mutelii	
Panderia pilsa	
Panicum maximum	
Panicum miliaceum	
Panicum sp.	
Panicum turgidum	Turgid panic grass
Parapholis incurva	
Paronychia arabica	Arabain whitlow-wort, Pidgeon's legs
Paspalum distichum	
Paspalum vaginatum	
Peganum harmala	
Pennisetum ciliare	
Pennisetum divisum	Bristle grass
Pennisetum glaucum	
Pennisetum orientale	
Phalaris minor	
Phoenix dactylifera	
Phragmites australis subsp. Altissimus	Common reed
Phragmites communis	
Plantago albicans	
Plantago boissieri	
Plantago ciliata	
Plantago coronopus	Buck's-horn plantain
Plantago notata	

Scientific Name	Common Name
Plantago ovata	
Pluchea ovalis	Fleabane
Poa infirma	
Polycarpaea arabicum	
Polycarpaea repens	Polycarpaea
Polycarpaea spicata	
Polycarpon arabicum	
Polycarpon patulum	
Polycarpon spicata	
Polypogon monspeliensis	
Portulaca oleracea	Wild portulaca, Purslane
Portulaca quadrifida	
Potamogeton sp.	
Prosopis farcta	Thorn bush
Prosopis juliflora	Mesquite
Ptergaillonia calycoptera	
Pulicaria crispa	
Pulicaria gnaphalodes	
Pulicaria undulata=Francoeuria crispa	Crisp-leaved fleabane
Raphanus raphanistrum	
Raphanus sativus	
Reichardia sp.	
Reichardia tingitana	Poppy-leaved reichardia
Reseda muricata	
Reseda stenostachya	
Rhanterium epapposum	Rhanterium
Rostraria cristata	
Rostraria pumila	
Rumex vesicarius	
Salicornia europaea	

Scientific Name	Common Name
Salicornia herbacea	Marsh samphire, Jointed glasswort
Salsola baryosma	Saltwort, Fetid saltwort
Salsola cyclophylla	
Salsola imbricata	
Salsola vermiculata	
Salsola villosa	
Salvia aegyptiaca	Egyptain sage
Samolus valerandi	
Savigyna parviflora	Small-flowered honesty
Schismus arabicus	
Schismus barbatus	
Sclerocephalus arabicus	Sclerocephalus
Scolymus maculatus	
Scrophularia deserti	Desert figwort, Desert snapdragon
Sececio glaucus	Buck's-horn groundsel
Seetzenia lanata	
Seetzenia orientalis	
Seidlitzia rosmarinus	
Senecio coronopifolius	
Sericostoma persicum	
Sesbania sesban	
Sesuvium sesuvioides	
Sesuvium verrucosum	Sesuvium
Setaria verticillata	
Setaria viridis	
Silene arabica	
Silene villosa	Desert campion
Sisymbrium irio	
Solanum nigrum	

Scientific Name	Common Name
sonchus asper	
Sonchus oleraceus	Soft-leaved thistle
Spergula fallax	
Spergularia bocconii	
Spergularia diandra	
Spergularia marina	
Spergularia salina	
Sphaerocoma aucheri	
Sphenopus divaricatus	
Sporobolus arabicus	Arabian drop-seed grass
Sporobolus ioclados	
Sporobolus spicatus	Drop-seed grass
Stenotaphrum secundatum	
Stipa capensis	Feather grass, Spaer grass
Stipagrostis plumosa	Plumose triple-awned grass
Stipagrostis socotrana	Plume grass, Silver plume grass
Suaeda aegyptiaca	Egyptian sea blite
Suaeda maritima	
Suaeda vermiculata	Sea blite
Tamarix aphlla	
Tamarix arabica	Arabian tamarisk
Tamarix macrocarpa	Large-fruited tamarisk
Tamarix pycnocarpa	
Taverniera aegyptiaca	
Taverniera spartea	Taverniera
Tetrapogon villosus	
Teucrium polium	Germander
Trachomitum venetum	
Trachynia distachya	
Tribulus bimucronatus	
Tribulus pentandrus	Tribulus, Caltrops

Scientific Name	Common Name
Tricholaena teneriffae	
Trigonella anguina	
Trigonella hamosa	
Trigonella stellata	Star fenugreek, Star trigonel
Typha domingensis	
Urospermum picroides	
Vicia monantha	
Vicoa pentanema	
Withania somnifera	
Ziziphus nummularia	
Ziziphus spina-christi	Sytain thorn tree
Zygophyllum qatarese	Bean caper
Zygophyllum simplex	Simple-leaved bean caper

IV.3. Gastropods and Bivalves

Scientific Name
Acar plicata
Acropaginula inflata
Acropella isseli
Acteon affinis
Amiantis umbonella
Anadara birleyana
Anadara ehrenbergi
Anadara uropigimelana
Ancilla castenea
Anodontia endentula
Anomia achaeus
Antigona lamellaris
Asaphis deflorata

Scientific Name
Asaphis violascens
Atactodea bahreniensis
Atactodea glabrata
Barbatia foliata
Barbatia helblingii
Barbatia lacerata
Barbatia setigera
Bassina foliacea
Bellucina semperiana
Benguina gubernaculum
Brechites attrahens
Bullaria ampulla
Callista erycina
Callista florida
Calyptraea pellucida
Cardita ffinchi
Cardites bicolor
Cerithidea cingulata
Cerithium caeruleum
Chama asperella
Chama lazarus
Chama pacifica
Chama reflexa
Cheilea cicatrosa
Chlamys livida
Chlamys senatorius
Circe corrugata
Circe scripta
Circenita callipyga
Clanculus pharaonius
Clementia papyracea

Scientific Name
Clypeomorus bifasciatus persica
Conus dictator
Corbula taitensis
Crassatella radiata
Cronia konkanensis
Ctena divergens
Cucullaea cucullata
Cypraea caurica
Cypraea lentiginosa
Cypraea turdus
Decatopecten plica
Dendrostrea frons
Dentalium longitrorsum
Dentalium octangulatum
Diodora funiculata
Divaricella cumingiana
Divaricella sechellensis
Divaricella sp.
Dosinia ceyloneca
Dosinia erythraea
Dosinia tumida
Electroma zebra
Engina mendicaria
Ensiculus cultellus
Epitonium pallasii
Ervilia pupurea
Eunaticina papilla
Ficus subintermedia
Fulvia australe
Fulvia papyracea
Fusinus townsendi

Scientific Name
Gafrarium pectinatum
Gari amethystus (tripartita)
Gari maculosa
Gari occidens
Gari ruppelliana
Gari weinkauffi
Gibbula declivis
Glycymeris lividus
Glycymeris pectunculus
Glycymeris striatularis
Haminea vitrea
Herpetopoma (Euchelus) asper
Hexaplex kuesterianus
Inquisitor griffithi
Irus macrophylla
Laternula anatina
Leptomya cochlearis
Limaria fragilis
Lioconcha ornata
Lithophaga robusta
Loxoglypta rhomboides
Lutraria australis
Mactra lilacea
Malvifundus regula
Marcia flammea
Maxacteon (Acteon) flammea
Meropesta nicobarica
Mitra bovei
Mitra pretiosa
Mitrella blanda
Moerella rosamunda

Scientific Name
Moerella sp.
Monodonta vermiculata
Murex scolopax
Natica lineata
Natica vitellus
Neopycnodonte cochlear
Paphia undulata
Pecten dorotheae
Phasianella solida
Pinctada anomioides
Pinctada maculata
Pinctada margaritifera
Pinctada nigra
Pinctada radiata
Pinctada rutila
Pinctada sp.
Pinctada sugillata
Pinna bicolor
Pinna muricata
Pitar hebraea
Pitar yerburyi
Plesiothyreus parabica
Plicatula australis
Plicatula plicata
Priotrochus kotschyi
Protapes gallus
Protapes sp.
Pteria penguin
Pupa alveola
Rapana bezoar
Rapana bulbosa

Scientific Name
Rhinoclavis fasciata
Scalptia scalarina
Semele sinensis
Semicassis faurotis
Septifer bilocularis
Siphonaria laciniosa
Solecurtus australis
Solen cylindraceus
Spondylus exilis
Stomatella elegans
Stomatia phymotis
Strombus persicus
Strombus plicatus sibbaldi
Sunetta donacina
Sunetta effosa
Tapes sulcarius
Tellina adamsi
Tellina arsinoensis
Tellina capsoides
Tellina emarginata
Tellina (Pinguitellina) pinguis
Tellina prismatica
Tellina rastellum
Tellina wallaceae
Terebellum terebellum
Thais carinifera
Thais mutabilis
Thais savignyi
Thais tissoti
Thracia adenensis
Timoclea arakana

Scientific Name
Timoclea sp.
Trachycardium arenicolum
Trachycardium lacunosum
Trachycardium maculosum
Trachycardium sp.
Trigonostoma costifera
Trisidos tortuosa
Trochus erythraeus
Tugonella decurtata
Turbo coronatus
Turbo radiatus
Turcica stellata
Turritella cochlea
Vermetus sulcatus
Vulsella vulsella
Xenophora corrugata

IV.4. Crustaceans

Scientific Name
Acanthonyx limbatus
Actaea savignyi
Alpheus lobidens
Ammohella indica
Ampelisca brevicornis
Ampelisca scabripes
Amphithoe ramondi
Anoplodacylus glandulifer
Ceradocus rubromaculatus
Ceradocus serratus

Scientific Name
Cirolana Parva
Cleistostoma dotilliforme
Cymadusa filosa
Cymodoce sp
Cyplocarcinus sp
Dardanus tinctor
Deamina spinosa
Diogenes avarus
Elasmopus rapax
Eurycarcinus orientalis
Eurydice peraticus
Gammaropsis atlantica
Gonodactylus demani
Hippolyte kraussiana
Hippolyte sp.
Hippolyte ventricosa
Hyale perieri
Hyastenus planasius
Ilyoplax frater
Lanocira gardineri stebbign
Leptochelia savignyi
Leucothoe spinicarp
Lysianassa ceratina
Macrophthalmus telescopicus
Maera quadrimana
Maera sp.
Metacirolana rotunda
Metagrespus messor ?
Metapenaeus stebbingi
Metaplax indica

Scientific Name
Metopograpsus messor
Mlacrophthalmus depressus
Moera pacifica
Orchestia platensis
Pagrus sp.
Paguristes perspicax
Palaemon pacificus?
Penaeus semisulcatus
Penaeus sp
Petrolisthes carinipes
Petrolisthes rufescens
Phylira sp.
Pilumnus Vespertilio
Platycheles natalensis
Rhopalophthalmus sp
Squilla sp.
Stenothoe vlida
Thalamita poissoni
Thalamita prymna
Triprotella amica
Tylodiplex sp
Upogebia rhadames
Ocypode saratan
Xantho exaratus

IV.5. Insects

Scientific Name	Common Name
Papilio demoleus demoleus	Citrus Swallowtail
Artogeia rapae iranica	Small Cabbage White
Pontia glauconome	Desert White
Euchole belemia	Green Striped White
Anaphaeis aurota	Caper White
Madais fausta fausta	Salmon Arab
Catopsilia florella	African Emigrant
Colias croceus	Clouded Yellow
Deudorix livia	Pomegranate Playboy
Lampides boeticus	Pea Blue
Tarucus rosaceus	Mediterranean Pierrot
Tarucus balkanicus	Balkan Pierrot
Zizeeria karsandra	Grass Blue
Chilades parrhasius	Small Cupid
Freyeria trochlus trochylus	Grass Jewel
Danaus chrysippus chrysippus	plain tiger
Hypolimnas misippus	Diadem
Vanessa cardui	Painted Lady
Junonia orithya cheesmani	Blue Pansy
Spialia doris doris	Desert Grizzled Skipper
Pelopidas thrax thrax	Millet Skipper

IV.6. Fishes

Scientific Name	Common Name	Local Name
Abalistes stellaris	Starry Triggerfish	
Ablennes hians	Barred Needlefish	Musaffaha
Abudefduf saxatilis	Sergeant Major	Ega'aisee
Acanthopagrus berda	Black Bream	She'em
Acanthopagrus bifasciatus	Doublebar Bream	Faskar, Bint el-nokhatha
Acanthurus sohal	Sohal	
Acropoma japonicum		
Aesopia cornuta	Horned Zebra Sole	Lessan
Aethaloperca rogaa	Redmouth Grouper	
Aetobatus narinari	Spotted Eagle Ray	Thoar Amer
Aetomyleus nichofii	Striped Eagle Ray	Thoar Amer
Alectis indicus	Indian Threadfin Trevally	Khait
Alepes djedaba	Shrimp Scad	Jinnees
Alepes melanoptera	Blackfin Scad	Jinnees
Alutera monoceros	Unicorn Filefish	Bughoomee
Amblygobius albimaculatus	Tailspot Goby	Nabbat
Amphiprion clarkii	Clark's Clownfish	Ega'aisee
Anthias conspicuus		
Aphanius dispar	Arabian Killifish	Harsoon
Apistus carinatus	Ocellated Waspfish	Firyaleh
Apogon aureus	Golden Cardinalfish	Sehaihet el-raai
Apogon bifasciatus	Doublebar Cardinalfish	Sehaihet el-raai
Apogon cyanosoma	Golstriped Cardinalfish	Sehaihet el-raai
Apogon quadrifasciatus	Four-banded Crdinalfish	Sehaihet el-raai
Apogon taeniatus	Twobelt Cardinalfish	Sehaihet el-raai
Argyrops spinifer	Long-spined Bream	Kofar, Thoar
Ariomma indica	Indian Driftfish	Bangara
Arius thalassinus	Giant Sea Catfish	Chim
Arothron stellatus	Blackspotted Puffer	Fugul

Scientific Name	Common Name	Local Name
Atherinomorus lacunosus	Robust Silverside	Manchoos
Atropus atropos	Cleftbelly Trevally	Jash
Atule mate	Yellowtail Scad	Jinnees
Batrachus grunniens	Toadfish	Naghagah
Bothus pantherinus	Panther Flounder	Khofaa'h
Caesio sp	Fusilier	Khattaf
Callionymus persicus	Gulf Dragonet	
Carangoides bajad	Orangespotted Trevally	Jash
Carangoides chrysophrys	Longnose Trevally	Jash
Carangoides ferdau	Blue Trevally	Jash
Carangoides malabaricus	Malabar Trevally	Jash
Caranx sexfasciatus	Bigeye Trevally	Jash
Carcharhinus amboinensis	Pigeye Shark	Jarjoor
Carcharhinus dussumieri	Whitecheek Shark	Jarjoor
Carcharhinus limbatus	Blackfin Shark	Jarjoor
Carcharhinus melanopterus	Blacktip Reef Shark	Jarjoor
Carcharhinus sorrah	Saw-toothed Reef Shark	Jarjoor
Centriscus scutatus	Shrimpfish	Selsab
Cephalopholis hemistiktos	Halfspotted Grouper	Eshnenowah
Chaetodon melapterus	Blackfin Butterflyfish	Misht el-aroos
Chaetodon nigropunctatus	Dark Butterflyfish	Ega'aisee, Egraisee
Chanos chanos	Milkfish	Sheem
Cheilinus lunulatus	Broomtail Wrasse	Mailag
Cheilodipterus arabicus	Arabian Cardinalfish	Sehaihet el-raai
Cheimerius nufar	Barred Silvery Bream	Andag
Chelonodon patoca	Milky-spotted Puffer	Fugul
Chilomycterus orbicularis	Round Burrfish	Fugul
Chiloscyllium arabicum	Arabian Carpet Shark	Hayyasseh
Chirocentrus nudus	Whitefin Wolf Herring	Heff
Choerodon robustus	Robust Tuskfish	Gain
Choridactylus multibarbus	Orangebanded Stingfish	Firyaleh

Scientific Name	Common Name	Local Name
Crenidens crenidens	Karanteen Bream	
Cryptocentrus lutheri	Luther's Goby	Nabbat
Cypselurus oligolepis	Largescale Flying fish	Jaradeh
Dactyloptena orientalis	Oriental Flying Gurnard	
Dascyllus trimaculatus	Domino	Ega'aisee
Dasyatis sephen	Cow-tailed Stingray	Lukhmah
Diagramma pictum	Painted Grunt	Khubor
Diplodus sargus kotschyi	Onespot Bream	Emchawah
Drepane punctata	Spotted Sicklefish	Imad
Dussumieria acuta	Rainbow Sardine	Oom
Echeneis naucrates	Sharksucher	Lazzaq
Ecsenius pulcher	Pretty Blenny	
Ephippus orbis	Spadefish	Thoar
Epinephelus areolatus	Areolated Grouper	Guttwa
Epinephelus bleekeri	Duskytail Grouper	Guttwa
Epinephelus caeruleopunctatus	White-spotted Grouper	
Epinephelus chlorostigma	Brownspotted Grouper	Simmana, Guttwa
Epinephelus epistictus	Broken-line Grouper	
Epinephelus latifasciatus	Banded Grouper	
Epinephelus multinotatus	White-blotched Grouper	Burtam
Epinephelus suillus	Grouper	Hamoor (L), Balool (S)
Euryglossa orientalis	Oriental Sole	Tabag- Lazag
Euthynnus affinis	Little Tune	Jibbab
Fistularia petimba	Rough Cornetfish	Obairy , Moghzal
Fowleria variegata	Variegated Cardinalfish	Sehaihet el-raai
Gastrophysus lunaris	Green Rough-backed Puffer	Fugul
Gazza minuta	Toothed ponyfish	
Gerres argyreus	Blackfin Mojarra	Badh el-rayash
Gerres filamentosus	Long-finned Mojarra	Rayasheh
Gerres oyena	Slenderspine Mojarra	Badh el-rayash (L) Musallakh(s)

Scientific Name	Common Name	Local Name
Gnathanodon speciosus	Golden Trevally	Rabeeb; Kefdar (large)
Grammoplites suppositus	Spotfin Flathead	Waharah
Gymnothorax undulatus	Mottled Moray	Nachooch
Gymnura poecilura	Spotted Butterflyray	Lukhmah
Halichoeres stigmaticus	Wrasse	Gain
Halichoeres zeylonicus	Wrasse	Gain
Hemiramphus far	Spotted Halfbeak	Sils
Heniochus acuminatus	Pennant Butterflyfish	Misht el-aroos
Himantura uarnak	Spotted Stingray	Lukhmah Rakta
Hippocampus kuda	Spotted seahorse	Wiz, Faras el-bahar
Ilisha melastoma	Indian Ilisha	Oom
Istigobius ornatus	Ornate Goby	Nabbat
Istiophorus platypterus	Sailfish	Faras
Labroides dimidiatus	Cleaner Wrasse	
Leiognathus bindus	Orangefin Ponyfish	Tarachee
Leiognathus equulus	Common Ponyfish	Rayasheh areedhah
Lepidotrigla omanesis	Oman Gurnard	Firyaleh
Lethrinus elongatus	Longnose Emperor	Sooley
Lethrinus lentjan	Redspot Emperor	Bakhsheeneh
Lethrinus mahsenoides	Redfin Emperor	Jimeh, Yimeh
Lethrinus nebulosus	Spangled Emperor	Sha'ree, Shehthooth
Liza alata	Diamond Mullet	Byah (L), Maid (s)
Liza carinata	Keeled Mullet	Byah (L), Maid (s)
Liza subviridis	Greenback Mullet	Byah (L), Maid (s)
Lobotes surinamensis	Tripletail	
Lutjanus argentimaculatus	River Snaper	sheggarh
Lutjanus ehrenbergi	Blackspot Snapper	Naisarah
Lutjanus fulviflammus	Dory Snapper	Naisarah
Lutjanus johni	John's Snapper	Naisarah
Lutjanus lutjanus	Bigey Snapper	Naisarah
Lutjanus malabaricus	Malabar Blood Snapper	Hamrah

Scientific Name	Common Name	Local Name
Lutjanus quinquelineatus	Five-lined Snapper	Naisarah
Lutjanus russelli	Russell's Snapper	Naisarah
Megalaspis cordyla	Hrdtail Scad	Teety
Mene maculata	Moonfish	
Minous monodactylus	Grey stingfish	Firyaleh
Muraenesox cinereus	Duggertooth Pikeconger	Nachooch
Nematalosa nasus	Bloch's Gizzard Shad	Ghowah, Jwaff
Nemipterus bleekeri	Bleeker's Threadfin Bream	Bassij
Nemipterus japonicus	Japanese Threadfin Bream	Bassij
Nemipterus peronii	Notched Threadfin Break	Bassij
Neopomacentrus sindensis	Violet Damsefish	Ega'aisee
Ostracion cyanurus	Bluetail Trunkfish	Sundook el-bahar
Pagellus affinis	Arabian Pandora	
Paramonacanthus choirocephalus	pig-face filefish	Bughoomee
Paramonacanthus oblongus	Hair-finned filefish	Bughoomee
Parapercis alboguttata	Sandperch	Wazagh
Parapercis robinsoni	Banded Sandperch	Wazagh
Parastromateus niger	Black pomfret	Halwayo
Pardachirus magmorattus	Moses Sole	Khofaa'h
Parupeneus heptacanthus	Cinnabar Goatfish	Hummer, Hawamer
Pegasus natans	Longtail Seamoth	
Pelates quadrilineatus	Fourlined Terapon	Garadhee, Zamroor
Pentaprion longimanus	Shortfin Mojarra	Badh el-rayash
Petroscirtes ancylodon	Sabre-toothed Blenny	Abu-mlais
Pinjalo pinjalo	Pinjalo Snapper	Na'aimee
Platax tiera	Batfish	Imad
Platycephalus indicus	Bartail Flathead	Waharah
Plectorhinchus gaterinus	Blackspotted grunt	Zeeneh, Asfar, Mutawa'a
Plectorhinchus pictus	Spotted Grunt	Forsh
Plectorhinchus sordidus	Grey Grunt	Janam
Plotosus lineatus	Striped Eel Catfish	Ai

Scientific Name	Common Name	Local Name
Pomacanthus maculosus	Yellowbar Anglefish	Anfouz
Pomacentrus tichourus	Reticulated Damselfish	Ega'aisee
Pomadasys argenteus	Silvery Grunt	Nagroor
Pomadasys stridens	Striped Grunt	Jamjam
Priacanthus tayenus	Purple-spotted Bigeye	Hamrah
Pristis zijsron	Longcomb sawfish	Bosayiaf
Pristotis jerdoni	Jerdon's Damselfish	Hatoof
Psettodes erumei	Indian Spiny Turbot	Khofaa'h
Pseudochromis dutoiti	Orange Dottyback	Nabbat
Pseudochromis persicus	Gulf Dottyback	Nabbat
Pseudorhombus arsius	Largetooth Flounder	Khofaa'h
Pseudosynanceia melanostigma	Blackmouth stonfish	Firyaleh
Pseudotriacanthus strigilifer	Long-spined Tripodfish	Chlaib el-dhow
Pterois volitans	Spotted Turkeyfish	Deech
Rachycentron canadus	Cobia	Sikin
Rastrelliger kanagurta	Indian Macherel	Khedhrah
Rhabdosargus haffara	Haffara Bream	Gorgofan
Rhina ancylostoma	Bowmouth Guitarfish	Hrairee
Rhinecanthus assasi	Picasso Triggerfish	Humarah
Rhizoprionodon acutus	Milk Shark, Sharp-nosed Shark	Jarjoor (large); Naood (small)
Rhynchobatus djiddensis	Shovel-nose,Giant Guitarfish	Hrairee
Sardinella albella	White Sardinella	Oom
Sardinella gibbosa	Goldstripe Sardinella	Oom
Sardinella longiceps	Indian oil Sardinella	Oom
Sardinella sirm	Spotted Sardinella	Oom
Saurida tumbil	Greater Lizardfish	Kasoor
Saurida undosquamis	Spotted Lizerdfish	Kasoor
Scarus ghobban	Bluebarred Parrotfish	Gain
Scarus persicus	Gulf parrotfish	Gain
Scarus psittacus	Palenose Parrotfish	Gain

Scientific Name	Common Name	Local Name
Scarus sordidus	Bullethead parrotfish	Gain
Scolopsis bimaculatus	Doubleblotch Spinecheek	Ebzaymee
Scolopsis ghanam	Dotted Spinecheek	Zarra'a
Scolopsis taeniatus	Banded Spinecheek	Ebzaymee
Scolopsis vosmeri	White -cheek Spinecheek	Hasseyeh
Scomberoides commersonianus	Largemouth Queenfish	Lehlah, Dela'h
Scomberoides tol	Needlescaled Queenfish	Lehlah, Dela'h
Scomberomorus commerson	Narrow-barred Spanish Mackerel	Channaad (L), Khubbat (S)
Scomberomorus guttatus	Spanish Mackerel	Channaad Farsee
Scorpaenopsis barbatus	Bearded Scorpionfish	Rajwah
Selar crumenophthalmus	Bigeye Scad	balegge
Selaroides leptolepis	Yellowstripe Trevally	Seeneh
Seriola dumerili	Yellowtail Trevally	Jibb
Seriolina nigrofasciata	Blackbanded Trevally	Hamam Arabee
Siganus canaliculatus	Pearlspotted Rabbitfish	Saffy
Siganus javus	Streaked Rabbitfish	Saffy senaiffy
Siganus spinus	Sequaretail Rabbitfish	Saffy
Sillago maculata	Blotchy Sillago	Hassoom
Sillago sihama	Silver Sillago	Hassoom
Solea bleekeri	Bleeker's	Lessan
Sorsogona tuberculata	Tuberculated Flathead	Waharah
Sparidentex hasta	Sobaity Bream	Sobaity (adult), Emzaizy (young)
Sphyraena obtusata	Yellowfinned Barracuda	Jidd (L), Dwailmee(M), Eghlee (S)
Sphyrna mokarran	Great Hammerhead	Agrun
Stegostoma fasciatum	Zebra Shark	Hayyasseh
Stephonolepis diasporos	Reticulated filefish	Bughoomee, Chlaib el-dhow
Stolephorus indicus	Indian Anchovy	Oom
Sufflamen albicaudatus	Bluethroat Triggerfish	Humarah
Synanceia nana	Stonefish	Firyaleh

Scientific Name	Common Name	Local Name
Synodus variegatus	Variegated Lizardfish	Kasoor
Terapon jarbua	Jarbua Terapon	Theeb
Terapon puta	Smallscaled Terapon	Zamroor
Terapon theraps	Largescaled Terapon	Theeb
Tetrosomus gibbosus	Thornback Trunkfish	Sundook-el-Bahar, Samak Younis
Thalassoma lunare	Moon Wrasse	Mailag
Thamnaconus modestoides	Modest filefish	Bughoomee
Torpedo sinuspersci	Mottled Electric Ray	Lukhmah
Tosana niwae		
Trachinocephalus myops	Bluntnose Lizardfish	Kasoor
Trachinotus blochii	Snubnose Pompano	Bu-sulbukh
Trachurus indicus	Arabian Scad	Khedhrah
Trachyrhampus bicoarctatus	Double-Ended Pipfish	
Triacanthus biaculeatus	Short-nose Tripodfish	Chalib el-dhow
Trichiurus lepturus	Largeheaded cutleassfish	Ee'sabah
Trichonotus setigerus	Sand-diver	
Tylosurus crocodilus	Crocodile Needlefish	Hagool
Upeneus sulphureus	Yellow Goatfish	Hummer farsee
Upeneus tragula	Darkband Goatfish	Ra'ai
Uranoscopus guttatus	Stargrazer	Rumramay
Uraspis helvola	Whitetongue Jack	Deyayo
Valamugil seheli	Bluespot Mullet	Maid, Byah
Xiphasia setifer	Snake Blenny	
Xyrichthys bimaculatus	Razorfish, Keel-headed Wrasse	Nabbat
Plotosus sp.	cat shark	Jarjorr, yaryorr
Carcharhinus amblyrhynchos	grey reef shark	Jarjorr, yaryorr
Carcharhinus sp.	black-tip shark	Jarjorr, yaryorr
Sphyrna lewini	hammerhead shark	Jarjorr, yaryorr
Zebrasoma xanthurum	Yellowtail Surgeonfish	

IV.7. Reptiles and Amphibians

Scientific Name	Common Name
Uromastyx microlepis	spiny tailed lizard
Hemidactylus flaviviridis	yellow bellied house Gecko
Hemidactylus persicus	Persian gecko
Bunopus spatalurus	Bunopus gecko
Cyrodactylus scaber	Keeled rock gecko
Pristurus rupestris	Dwarf rock gecko
Stenodactylus arabicus	stenodactylus gecko
Psammophis schokari	elegant sand snake
Eremias brevirostris	short nosed lacerta
Coluber ventromaculata	rat snake
Agama jayakari	Jayakar's agma lizard
Eryx jayakari	Jayakar's sand boa
Mabuya aurata septemaeniata	common skink
Sincus conirostris	sand skink
Rana ridibunda (= ?Bufo arabicus)	marsh frog
Chelonia mydas	Green Turtle
Caretta caretta	loggerhead turtle
Eretmochelys imbricata	hawksbill marine turtle
Hydrophis cyanocinctus	blue-banded sea snake
Pelamis platurus	yellow sea snake
Clemmys (Mauremys) caspica	Caspian terrapin

IV.8. Birds

Scientific Name	Common Name
Acridotheres tristis	Common Mynah Introduced
Accipiter nisus	Sparrowhawk
Acrocephalus agricola	Paddyfield Warbler
Acrocephalus arundinaceus	Great Reed Warbler

Scientific Name	Common Name
Acrocephalus dumetorum	Blyth's Reed Warbler
Acrocephalus melanopogon	Moustached Warbler
Acrocephalus palustris	Marsh Warbler
Acrocephalus schoenobaenus	Sedge Warbler
Acrocephalus scirpaceus	European Reed-Warbler
Acrocephalus stentoreus	Clammorous Reed-Warbler
Actitis hypoleucos	Common Sandpiper
Alaemon alaudipes	Greater Hoopoe-Lark
Alauda arvensis	Eurasian Skylark
Alauda gulgula	Oriental Skylark
Alcedo atthis	Common Kingfisher
Amandava amandava	Red Avadavat
Ammomanes cincturus	Bar-tailed Desert Lark
Ammomanes deserti	Desert Lark
Anas acuta	Pintail
Anas clypeata	Shoveler
Anas crecca	Teal
Anas penelope	Wigeon
Anas platyrhynchos	Mallard
Anas querquedula	Garganey
Anas strepera	Gadwall
Anser anser	Greylag Goose
Anthus campestris	Tawny Pipit
Anthus cervinus	Red-throated Pipit
Anthus novaeseelandiae	Richard's Pipit
Anthus pratensis	Meadow Pipit
Anthus spinoletta	Water Pipit
Anthus trivialis	Tree Pipit
Apus affinis	Little Swift
Apus apus	Common Swift
Apus melba	Alpine swift

Scientific Name	Common Name
Apus pallidus	Pallid Swift
Aquila clanga	Spotted Eagle
Aquila nipalensis	Steppe Eagle
Ardea cinerea	Grey Heron
Ardea purpurea	Purpul Heron
Ardeola ralloides	Squacco Heron
Arenaria interpres	Turnstone
Asio flammeus	Short-eared Owl
Athene noctua	Little Owl
Aythya ferina	Pochard
Aythya fuligula	Tufted Duck
Aythya nyroca	Ferruginous Duck
Botaurus stellaris	Great Bittern
Bubo bubo	Eurasian Eagle-Owl
Bubulcus ibis	Cattle Egret
Bucanetes githagineus	Trumpeter Finch
Bucanetes mongolicus	Mongolian trumpeter Finch
Burhinus oedicnemus	Stone Curlew
Buteo buteo	Common Buzzard
Buteo rufinus	Long-legged Buzzard
Butorides striatus	Striated Heron
Calandrella brachydactyla	Short-toed Lark
Calandrella rufescens	Lesser Short-toed Lark
Calidris alba	Sanderling
Calidris alpina	Dunlin
Calidris ferruginea	Curlew Sandpiper
Calidris minuta	Little Stint
Calidris subminuta	Long-toed Stint
Calidris temminckii	Temminck's Stint
Calidris tenuirostris	Great Knot
Caprimulgus aegyptius	Egyptian Nightjar

Scientific Name	Common Name
Caprimulgus europaeus	Eurasian Nightjar
Carduelis carduelis	European Goldfinch
Carduelis spinus	Eurasian Siskin
Carpodacus erythrinus	Common Rosefinch
Carpospiza brachydactyla	Pale Rock Sparrow Finch
Cercotrichas galactotes	Rufous Bush Chat
Cercotrichas podobe	Black Bush Robin
Ceryle rudis	Pied Kingfisher
Charadrius alexandrinus	Kentish Plover
Charadrius asiaticus	Caspian Plover
Charadrius dubius	Little Ringed Plover
Charadrius hiaticula	Ringed Plover
Charadrius leschenaultii	Greater Sand Plover
Charadrius mongolus	Lesser Sand - Mongolian Plover
Charadrius morinellus	Dotterel
Charadrius pecuarius	Kittlitz's Plover
Chettusia gregaria	Sociable Plover
Chettusia leucura	White-tailed Plover
Chlamydotis undulata	Houbara Bustard
Chlidonias hybridus	Whiskered Tern
Chlidonias leucopterus	White-winged Black Tern
Chlidonias niger	Black Tern
Ciconia ciconia	White Stork
Circaetus gallicus	Short-toed Eagle
Circus aeruginosus	Marsh Harrier
Circus cyaneus	Hen Harrier
Circus marcrourus	Pallid Harrier
Circus pygargus	Montagu's Harrier
Clamator glandarius	Great Spotted Cuckoo
Columba livia	Rock Dove
Coracias bengalensis	Indian Roller

Scientific Name	Common Name
Coracias garrulus	European Roller
Corvus ruficollis	Brown-necked Raven
Corvus splendens	Indian House Crow
Coturnix coturnix	Common Quail
Crex crex	Corncrake
Cuculus canorus	Common Cuckoo
Cursorius cursor	Cream-colored Courser
Cygnus columbianus	Bewick's Swan
Cygnus olor	Mute Swan
Delichon urbica	House-Martin
Dromas ardeola	Crab Plover
Egretta alba	Great White Egret
Egretta garzetta	Little Egret
Egretta gularis	Western Reef Heron
Emberiza aureola	Yellow-breasted Bunting
Emberiza cineracea	Cinereous Bunting
Emberiza hortulana	Ortolan Bunting
Emberiza melanocephala	Black-headed Bunting
Emberiza schoeniclus	Reed Bunting
Eremopterix nigriceps	Black-crowned Finch Sparrrow-Lark
Erithacus rubecula	European Robin
Euodice malabarica	Indian Silverbill
Falco biarmicus	
Falco cherrug	Saker Falcon
Falco columbarius	Merlin
Falco concolor	Sooty Falcon
Falco naumanni	Lesser Kestrel
Falco peregrinus	Peregrine Falcon
Falco subbuteo	Eurasian Hobby
Falco tinnunculus	Common Kestrel
Ficedula albicollis	Collared Flycatcher

Scientific Name	Common Name
Ficedula parva	Red-breasted Flycatcher
Ficedula semitorquata	Semicollared Flycatcher
Francolinus pondiccerianus	Grey Francolin
Fringilla coelebs	Chaffinch
Fringilla montifringilla	Brambling
Fulica atra	Common Coot
Galerida cristata	Crested Lark
Gallinago gallinago	Common Snipe
Gallinago media	Great Snipe
Gallinago stenura	Pintail Snipe
Gallinula chloropus	Common Moorhen
Gelochelidon nilotica	Gull-billed Tern
Glareola lactea	Little Pratincole
Glareola pratincola	Collared Pratincole
Glareola nordmanni	Black-Winged Pratincole
Grus grus	Common Crane
Haematopus ostralegus	Eurasian Oystercatcher
Hieraaetus pennatus	Booted Eagle
Himantopus himantopus	Black-winged Stilt
Hippolais icterina	Icterine Warbler
Hippolais languida	Upcher's Warbler
Hippolais pallida	Olivaceous Warbler
Hirundo daurica	Red-rumped Swallow
Hirundo rustica	Swallow
Hirundo(Ptyonoprogne) rupestris	Eurasian Crag-Martin
Hoplopterus indicus	Red-Wattled Plover
Hoplopterus spinosus	Spur-Winged Plover
Hypocolius ampelinus	Grey Hypocolius
Irania gutturalis	White-throated Robin
Ixobrychus minutus	Little Bittern
Jynx torquilla	Eurasian Wryneck

Scientific Name	Common Name
Lanius collurio	Red-backed Shrike
Lanius excubitor	Great Grey Northern Shrike
Lanius isabellinus	Isabelline Rufous-tailed Shrike
Lanius minor	Lesser Grey Shrike
Lanius nubicus	Masked Shrike
Lanius senator	Woodchat Shrike
Larus argentatus	Herring Gull
Larus armenicus	Armenian Gull
Larus cachinnans	Yellow-legged Gull
Larus canus	Common Gull
Larus fuscus	Lesser Black-backed Gull
Larus genei	Slender-billed Gull
Larus hemprichii	Sooty Gull
Larus ichthyaetus	Great Black-headed Gull
Larus minutus	Little Gull
Larus ridibundus	Common Black-headed Gull
Limicola falcinellus	Broad-billed Sandpiper
Limosa lapponica	Bar-tailed Godwit
Limosa limosa	Black-tailed Godwit
Locustella fluviatilis	Eurasian River Warbler
Locustella lusciniodes	Savi's Warbler
Locustella naevia	Common Grasshopper-Warbler
Lonchura(Euodice) malabarica	Indian Silverbill Introduced
Lonchura malacca	Black-headed Munia
Lullula arborea	Wood Lark
Luscinia luscinia	Thrush Nightingale
Luscinia megarhynchos	Common Nightingale
Luscinia svecica	Bluethroat
Lymnocryptes minimus	Jack Snipe
Marmaronetta angustirostris	Marbled Teal
Melanocorypha bimaculata	Bimaculated Lark

Scientific Name	Common Name
Melanocorypha calandra	Calandra Lark
Mergus serrator	Red-breasted Merganser
Merops apiaster	European Bee-eater
Merops orientalis	Little Green Bee-eater
Merops superciliosus	Blue-cheeked Bee-eater
Miliaria calandra	Corn Bunting
Milvus migrans	Black Kite
Monticola saxatilis	Rock Thrush
Monticola solitarius	Blue Rock -Thrush
Motacilla alba	White Wagtail
Motacilla cinerea	Grey Wagtail
Motacilla citreola	Citrine Wagtail
Motacilla flava	Yellow Wagtail
Muscicapa striata	Spotted Flycatcher
Netta rufina	Red-crested Pochard
Nettapus coromandelianus	Cotton Teal
Numenius arquata	Eurasian Curlew
Numenius phaeopus	Whimbrel
Nycticorax nycticorax	Black-crowned Night-Heron
Oena capensis	Namaqua Dove
Oenanthe alboniger	Hume's Wheatear
Oenanthe deserti	Desert Wheatear
Oenanthe finschii	Finsch's Wheatear
Oenanthe hispanica	Black-eared Wheatear
Oenanthe isabellina	Isabelline Wheatear
Oenanthe leucopyga	White-crowned Black Wheatear
Oenanthe lugens	Mourning Wheatear
Oenanthe monacha	Hooded Wheatear
Oenanthe oenanthe	Northern Wheatear
Oenanthe pleschanka	Pied Wheatear
Oenanthe xanthoprymna	Red-tailed Wheatear

Scientific Name	Common Name
Oriolus oriolus	Eurasian Golden-Oriole
Otus brucei	Striated Scops-Owl
Otus scops	Common Scops-Owl
Pandion haliaetus	Osprey
Passer domesticus	House Sparrow
Passer hispaniolensis	Spanish Sparrow
Passer moabiticus	Dead Sea Sparrow
Pelecanus onocrotalus	White Pelican
Pernis apivorus	Honey Buzzard
Petronia brachydactyla	Pale Rock Sparrow
Petronia xanthocollis	Yellow-throated Sparrow
Phalacrocorax carbo	Great Cormorant - Cormorant
Phalacrocorax nigrogularis	Socotra Cormorant
Phalaropus lobatus	Red-necked Phalarope
Philomachus pugnax	Ruff
Phoenicopterus ruber	Greater Flamingo
Phoenicurus erythronotus	Eversmann's Redstart
Phoenicurus ochruros	Black Redstart
Phoenicurus phoenicurus	Common Redstart
Phylloscopus collybita	Common Chiffchaff
Phylloscopus inornatus	Inonate Yellow-browed Warbler
Phylloscopus neglectus	Plain Leaf-Warbler
Phylloscopus sibilatrix	Wood Warbler
Phylloscopus trochiloides	Greenish Warbler
Phylloscopus trochilus	Willow Warbler
Platalea leucorodia	Eurasian Spoonbill
Plegadis falcinellus	Glossy Ibis
Ploceus bengalensis	Black-throated Weaver
Ploceus manyar	Baya Weaver
Ploceus philippinus	Streaked Weaver
Pluvialis apricaria	Eurasian Golden Plover

Scientific Name	Common Name
Pluvialis fulva	Pacific Golden Plover
Pluvialis squatarola	Grey Plover
Podiceps cistatus	Great Crested Grebe
Podiceps nigricollis	Black-necked Grebe
Prozana parva	Little Crake
Prozana prozana	Spotted Crake
Porzana pusilla	Baillion's Crake
Prinia gracilis	Graceful Warbler
Psittacula eupatria	Alexandrine Parakeet
Psittacula krameri	Ring-necked Parakeet
Pterocles orientalis	Black-bellied Sandgrouse
Ptyonoprogne rupestris	Crag Martin
Pycnonotus cafer	Red-vented Bulbul
Pycnonotus leucogenys	White-cheeked Bulbul
Rallus aquaticus	Water Rail
Recurvirostra avosetta	Pied Avocet
Remiz pendulinus	Eurasian Penduline-Tit
Bucanetes githagineus	Trumpeter Finch
Bucanetes mongolicus	Mongolian Trumpeter Finch
Riparia riparia	Sand Martin
Saxicola rubetra	Whinchat
Saxicola torquata	Common Stonechat
Scolopax rusticola	Eurasian Woodcock
Stercorarius parasiticus	Artic Skua
Stercorarius pomarinus	Pomarine Skua
Sterna albifrons	Little Tern
Sterna anaethetus	Bridled Tern
Sterna bengalensis	Lesser Crested-Tern
Sterna bergii	Swift Tern Great Crested-Tern
Sterna caspia	Caspian Tern
Sterna dougallii	Roseate Tern

Scientific Name	Common Name
Sterna fuscata	Sooty Tern
Sterna hirundo	Common Tern
Sterna repressa	White-cheeked Tern
Sterna sandvicensis	Sandwich Tern
Sterna saundersi	Saunders' Little Tern
Sterna nilotica	Gull-billed Tern
Streptopelia decaocto	Eurasian Collared-Dove
Streptopelia roseogrisea	African Collared-Dove
Streptopelia senegalensis	Palm or Laughing Dove
Streptopelia turtur	European Turtle-Dove
Sturnus roseus	Rose-coloured Starling
Sturnus vulgaris	Common Starling
Sylvia althaea	Hume's Lesser Whitethroat
Sylvia atricapilla	Blackcap
Sylvia borin	Garden Warbler
Sylvia communis	Common Whitethroat
Sylvia curruca	Lesser Whitethroat
Sylvia hortensis	Orphean Warbler
Sylvia minula jaxartica	Desert Lesser Whitethroat
Sylvia mystacea	Menetries' Warbler
Sylvia nana	Desert Warbler
Sylvia nisoria	Barred Warbler
Tachybaptus ruficollis	Little Grebe
Tachymarptis(Apus) melba	Alpine Swift
Tadorna ferruginea	Ruddy Shelduck
Tadorna tadorna	Shelduck
Xenus cinereus	Terek Sandpiper
Tringa erythropus	Spotted Redshank
Tringa glareola	Wood Sandpiper
Actitis hypoleucos	Common Sandpiper
Tringa nebularia	Common Greenshank

Scientific Name	Common Name
Tringa ochropus	Green Sandpiper
Tringa stagnatilis	Marsh Sandpiper
Tringa totanus	Common Redshank
Turdus iliacus	Redwing
Turdus merula	Eurasian Blackbird
Turdus philomelos	Song Thrush
Turdus pilaris	Fieldfare
Turdus ruficollis	Black-throated Thrush
Turdus torquatus	Ring Ouzel
Turdus viscivorus	Mistle Thrush
Tyto alba	Barn Owl
Upupa epops	Eurasian Hoopoe
Chettusia gregaria	Sociable Plover
Chettusia leucura	White-tailed Plover
Vanellus vanellus	Lapwing
Xenus cinereus	Terek Sandpiper

IV.9. Mammals

Scientific Name	Common Name
Gazella subgutturosa	Arabian Sand gazelle
Gazella subgutturosa marica	Reem gazaelle
Oryx leucoryx	Arabian oryx
Lepus capensis arabicus	Arabian(Brown) hare
Lepus capensis atallahi	Arabian(Brown) hare
Hemiechinus auritus	long eared desert hedgehog
Paraechinus aethiopicus	Ethiopian hedgehog
Herpstes edwardsi	Indian grey mongoose
Suncus murinus	Indian House Shrew
Rattus rattus	Black Rat

Rattus norvegicus	Brown Rat
Mus musculus	House Mouse
Jaculus jaculus	Lesser Three toed Jerboa
Pipistrellus kuhli	Kuhls pipistrelle bat
Tphozous nudiventris	Naked bellied Tomb Bat
Assllia tridens	Trident Leaf Nosed Bat
Pipistrellus rueppelli	Rueppel's pipistrelle bat
Camelus dromedarius	Camel
Dugong dugon	Dugong
Megaptera novaeangliae	Humpback dolphin
Delphis delphis	common dolphin
Tursiops truncatus aduncus	bottle-nosed dolphin

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