PROTECTED AREAS

OF EGYPT:

TOWARDS THE FUTURE

ARAB REPUBLIC OF EGYPT

Ministry of State for Environmental Affairs
Egyptian Environmental Affairs Agency
Nature Conservation Sector

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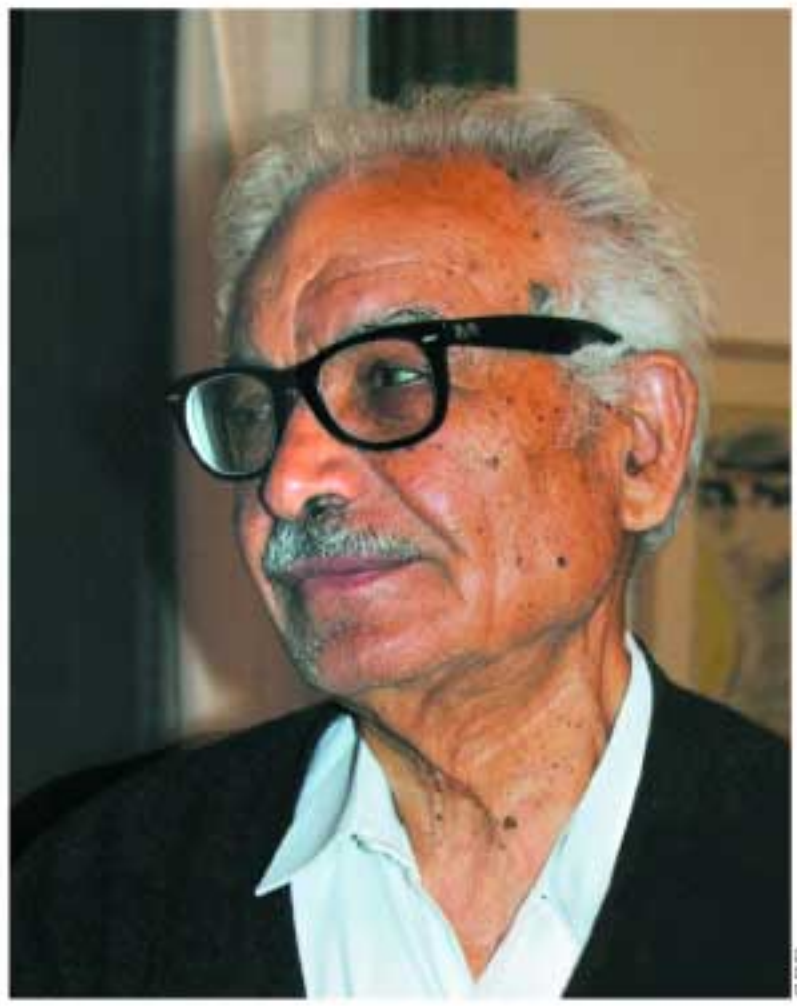
Dedication



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In the year of his 85th birthday this document is dedicated to Dr. Mohammed Kassas, Emeritus Professor, Cairo University and former President of IUCN, in acknowledgement of his tireless efforts in safeguarding Egypt's natural heritage. Dr. Kassas is a mentor and an inspiration to the new generations of conservationists in Egypt, and to whom he continues to provide guidance and support.

Acronyms

DGCS	Italian General Directorate for Development Cooperation (Italian Cooperation)
EEAA	Egyptian Environmental Affairs Agency
EEPP	Egyptian Environmental Policy Program
EIA	Environmental Impact Assessment
EIECP	Egyptian Italian Environmental Cooperation Programme
EU	European Union
FAO	Food and Agriculture Organisation
GOE	Government of Egypt
GEF	Global Environmental Facility
IUCN	International Union for the Conservation of Nature
LE	Egyptian Pound
MSEA	The Ministry of State for Environmental Affairs
NCS	Nature Conservation Sector
NCSCB	Nature Conservation Sector Capacity Building Project
TDA	Tourism Development Authority of Egypt
USAID	United States Agency for International Development
UNEP	United Nations Environment Program
UNDP	United Nations Development Program

Foreword

Since prehistoric times Egypt has relied upon its wealth of natural resources to sustain its civilization. In the 21st century, biodiversity has come to be recognized as integral to the health, well-being and prosperity of the country. The challenge facing Egypt is how to balance the needs of a populous developing nation with protection of its biodiversity. Like the rest of the world Egypt faces new and difficult environmental challenges which will likely be exacerbated by the uncertainties of climate change. The increasing loss of biodiversity combined with ongoing desertification contribute to the reduction of the nation's natural productivity.

Egypt has made great strides in Protected Area management in the past twenty years – a relatively short period of time to establish a system that is entirely new to the country. This report looks at the history of Protected Areas in Egypt, the Egyptian experience, and the outlook for the future. There are many success stories, and many things yet to be done to enhance the management of these areas. We have learned that well-managed protected areas are one of the bases of sustainable development. They generate significant investment and rural employment opportunities, contribute to the alleviation of poverty, and thereby constitute a vital element in our strategy to meet Egypt's Millennium Development Goals.

We appreciate the assistance of individuals and organizations, national and international, who have contributed over the years to build an effective national network of Protected Areas. We would like to recognize the staff of the Nature Conservation Sector, the Director, managers, rangers, community guards, researchers and all the staff and line employees, for their hard work and dedication in safeguarding and managing our national treasures. Donors who have contributed financial and technical assistance have provided knowledge and experience that will continue to be models for Egypt and for other countries in the administration and management of Protected Areas.

Protected areas are an investment in our future. By maintaining ecological processes in these areas of land and water we are preserving the natural resilience of the resource base, thus retaining options for remedial action as well as economic development that otherwise would be lost.

Eng. Maged George
Minister of State for Environmental Affairs

PART 1

Nature Conservation in Egypt

Lake Magrah (Qatttara)

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A Global Perspective on Protected Areas

Protected areas are a fundamental tool used worldwide for protecting natural resources, creating a buffer and refuge against a rising tide of human impacts. The first nature reserve in modern history is Yellowstone National Park in the United States, established in 1872. Today, there are 114,000 protected areas around the world in almost every country, covering nearly 12% of the world's land surface. In addition to preserving outstanding examples of natural habitats and providing refuges for endangered species of plants and animals, they also play an increasingly important role in social and economic development.

Nearly all countries in the Middle East and North Africa have protected areas. The management of protected areas in the region is variable, with some countries having more developed networks than others. Arab countries recognized as leaders in protected areas include Tunisia, Jordan, Saudi Arabia and Oman. Egypt is likewise considered one of the leading countries in the region in this activity, differing mainly in the level of resources and support its protected areas.

Table 1: Protected area coverage in the Middle East and North Africa[1]

Country	Area (km²)	Number	Area protected (km²)	% land area protected
Algeria	2,381,745	19	119,192	5.00
Egypt[2]	1,000,250	24	94,183	9.42
Iran	1,648,000	68	82,995	5.04
Jordan	96,000	10	2,903	3.02
Lebanon	10,400	1	35	0.34
Libya	1,759,540	6	173	0.01
Morocco	458,730	10	3,621	0.79
Oman	271,950	29	37,362	13.74
Saudi Arabia	2,400,900	10	62,013	2.58
Sudan	2,505,815	16	93,824	3.74
Turkey	779,450	44	8,194	1.05
Tunisia	165,150	7	449	0.27

1. From Global Protected Areas Summary Statistics (WCMC 1996).
2. Egypt's data is updated based on statistics from 2003.

NATURE CONSERVATION IN EGYPT

President Hosni Mubarak, addressing the Opening of Parliament in November 2001, stated that "environmental preservation is no longer a luxury but has become a necessity for protecting the nation's health and enabling it to achieve maximum benefit from Egypt's natural resources."

The Ministry of State for Environmental Affairs (MSEA) and its executive arm, the Egyptian Environmental Affairs Agency (EEAA) consider nature conservation critical to the national environmental strategy. Egypt's strategic objective of environmental policy is to integrate environmental concerns relevant to managing natural resources into all national policies, development plans, programs and projects. The medium-term objective is to preserve natural resources, biological diversity and national heritage within the context of sustainable development.

The Nature Conservation Sector (NCS) of the EEAA is responsible for nature conservation and management of Protected Areas. It is entrusted with implementing policies, programs, studies and other actions that ensure compliance with the nation's habitat and species protection legislation and the nation's commitment to international conventions for the conservation of nature.


Wadi Hoodein (Elba)

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In the 1970's, Dr. Mohamed Kassas, noted Egyptian ecologist, conservationist and former President of the International Union for the Conservation of Nature (IUCN), along with other local conservationists spearheaded efforts to pass legislation for the creation of protected areas in Egypt. As a result of their efforts, President Hosni Mubarak in 1983 signed Law 102 for Natural Protectorates, providing a legal framework for setting aside tracts of land and bodies of water as Protected Areas. This was followed in the same year by a decree declaring the first Protected Area, Ras Muhammad National Park. Subsequent Prime Ministerial Decrees were issued declaring additional Protected Areas, the most recent being Wadi El Gemal National Park, in 2003.

Initially, the Egyptian Wildlife Service under the Ministry of Agriculture was entrusted with managing Protected Areas. By Law 102/1983 the EEAA assumed the mandate for the development and management of Protected Areas in Egypt. In the early 1990's, the European Union (EU) assisted the EEAA in establishing the management of Ras Muhammad National Park. This project acted as a catalyst for developing the national Protected Area Network.

The EU program, which lasted 14 years, was expanded to cover other Protected Areas in South Sinai, including the St. Katherine Protectorate. The success of the EU-EEAA projects attracted the interest of other donors and new protected area projects were undertaken.

LEGISLATION

Law 102 of 1983 provides the legislative framework for establishing and managing protected areas in Egypt which are defined as, "any area of land or coastal or inland water characterized by special flora, fauna and natural features having cultural, scientific, tourism or aesthetic value."

With growing awareness of the importance of managing resource use to sustain development, as well as awareness of rapid environmental degradation, increased attention was given to environmental protection. The EEAA was restructured in 1992 and Law 4 of 1994 became the primary legislation for environmental management, creating the Nature Conservation Sector for management of Egypt's Protected Areas. The MSEA was established in 1997 and the EEAA brought under its umbrella.

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INTERNATIONAL CONVENTIONS

Conservation of critical ecosystems and biodiversity is mandated by regional and international conventions. Egypt is signatory to eight international and regional conventions which have provisions for protected areas and these have, according to the Constitution of Egypt, the same power as Egyptian Law. The conventions obligate Egypt to establish and maintain a network of protected areas in order to protect and conserve ecosystems, representative habitats, threatened species, cultural heritage sites, and traditional knowledge which is of value to all mankind.

INTERNATIONAL CONVENTIONS WITH PROVISIONS FOR PROTECTED AREAS SIGNED BY EGYPT

* African Convention on the Conservation of Nature and Natural Resources, Algiers 1968
* Convention on Wetlands of International Importance Especially as Waterfowl Habitat, Ramsar 1971
* Convention Concerning the Protection of World Cultural and Natural Heritage, Paris 1972
* Convention on International Trade in Endangered Species (CITES) 1973
* Convention on the Conservation of Migratory Species of Wild Animals, Bonn 1979
* Protocol Concerning Mediterranean Specially Protected Areas, Geneva 1982
* Convention on Biological Diversity, Rio de Janeiro 1992
* Agreement on the Conservation of African-Eurasian Migratory Waterbirds, The Hague 1995

PROTECTED AREAS IN EGYPT

In Egypt, as elsewhere, "brown issues" such as pollution abatement and solid waste management have traditionally received higher priority than nature conservation. However, in recent years the growing popularity of Egypt's protected areas and awareness of their economic value, particularly for tourism, have resulted in giving biodiversity conservation more prominence in the national environment agenda.

Box 1: Milestones for protected area development in Egypt

1983	Passage of Law 102 concerning protected areas
1983	Declaration of the first Protected Area, Ras Muhammad National Park
1992	Establishment of the Nature Conservation Sector
1992	Egypt signed the Convention on Biodiversity, ratified in 1994
1993	Passage of Law 4 concerning environmental protection
1998	Adoption of the National Biodiversity Strategy and Action Plan
1998	Formulation of the Protected Area System Plan
2001	Inclusion of all existing and proposed protected areas on the official GOE Land Use Map issued by Presidential Decree
2002	First Protected Area management plan, for Wadi El Rayan
2002	First Egyptian International Conference on Protected Areas and Sustainable Development, Sharm El Sheikh
2003	Declaration of the 24th Protected Area, Wadi El Gemal National Park
2005	Declaration of Wadi El Hitan as the first Natural World Heritage Site in Egypt

A growing trend, especially in Africa, is to view the management of natural resources as an economic activity than can be financially self supporting and contribute to both the economic and social well being of the nation. Protecting wild and natural areas has come to be seen as a legitimate, and desirable, choice of land use policies at the national level.

NATURE CONSERVATION SECTOR: OUR MISSION

Egypt has exceptional wild resources -- coral reefs, spectacular desert ecosystems, rich fossil deposits, vast bird migrations – that underpin the economy and provide advantages in the massive and growing nature based tourism industry. Recognizing the value of this biodiversity and its critical role in maintaining and enhancing the well being of the country, the Government of Egypt in partnership with stakeholders, is committed to maintaining a healthy, well managed and ecologically representative system of Protected Areas and making them financially self supporting. Furthermore, it is committed to managing wild resources outside these areas sustainably, for the benefit of the people living on the land with the resources.

THE PROTECTED AREA NETWORK

Since the passage of Law 102/1983, twenty-four Protected Areas have been declared. The present network covers almost 10% of the country's land and marine areas and includes a representative range of habitats and physiographic regions, along with other sites of importance such as biodiversity hotspots, cultural heritage sites, geological formations and landscapes of outstanding natural beauty. The Protected Areas are of varying size, from the largest, Elba, at about 35,000 km^2 to Saluga and Ghazal Islands, at 0.5 km^2.

Until the mid-1990's, protected areas were declared in a somewhat subjective manner rather than according to predetermined criteria.

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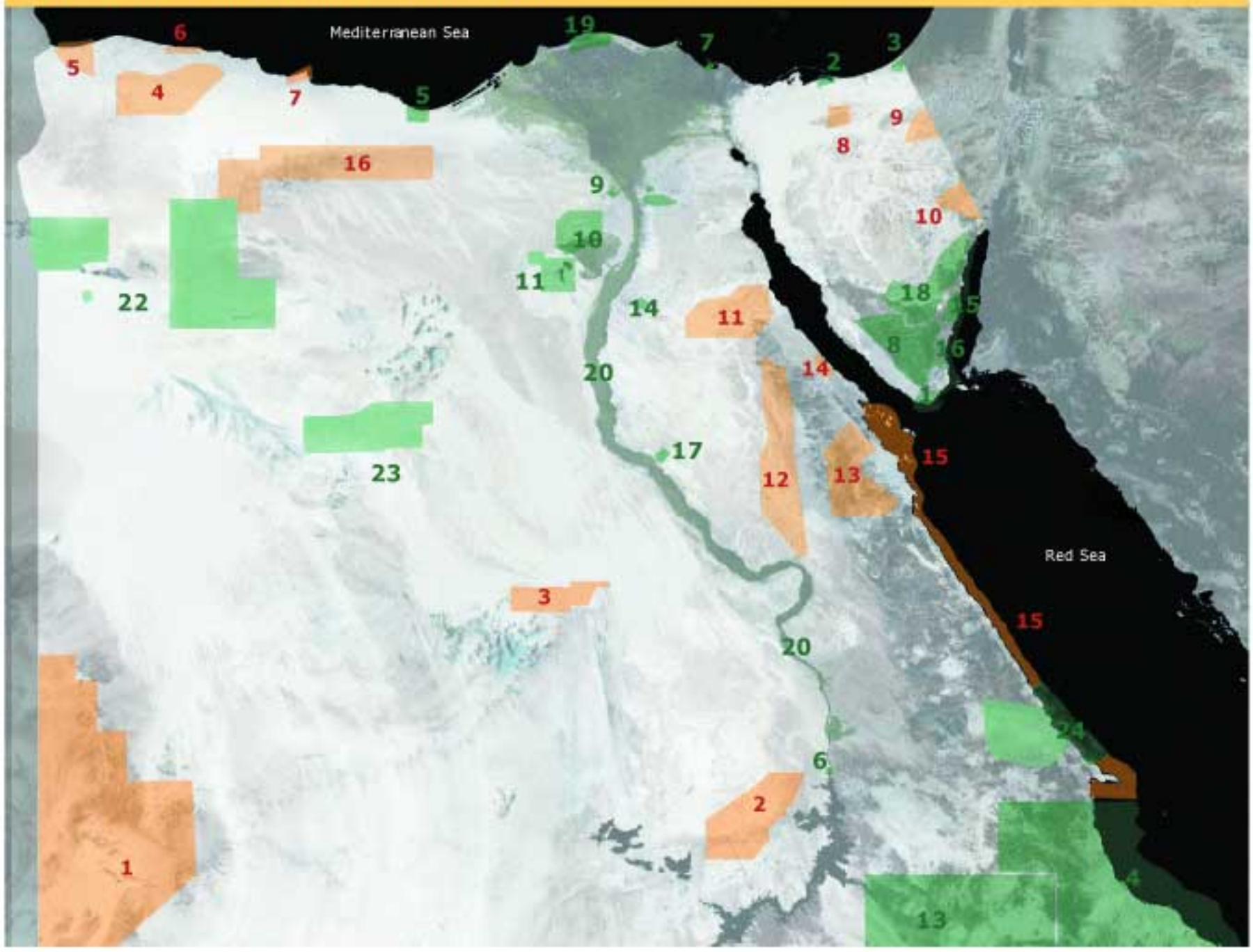
Consequently, there is insufficient representation of some habitats in the network, particularly marine habitats, inclusion of some areas with questionable criteria, and a number of important areas that should have been included remain outside the system. Since adoption of the National Protected Area System Plan in 1998, protected areas have been declared in a more systematic manner.

Figure 1: The protected area network of Egypt



Current protected areas

1. Ras Muhammad
2. Zaranik
3. El Ahrash
4. Elba
5. El Omayed
6. Saluga and Ghazal
7. Ashtum El Gamil
8. St. Katherine
9. El Hassana Dome
10. Lake Qarun
11. Wadi El Rayan
12. Maadi Petrified Forest
13. Wadi El Allaqi
14. Sannur Cave
15. Abu Galum
16. Nabq
17. Wadi El Assiuti
18. Taba
19. Lake Burullus
20. Nile River Islands
21. Wadi Digla
22. Siwa
23. White Desert
24. Wadi El Gemal

List of proposed areas

1. El Gilf El Kebir
2. Kurkur and Dungul
3. Um El Dabadib
4. El Qasr
5. El Salum
6. El Shuwaila
7. Ras El Hekema
8. Gebel El Maghara
9. El Quseima
10. Wadi El Gerafi
11. Gebel El Geleala El Qebleya
12. Wadi Qena
13. Gebel Shayeb El Banat
14. Malahet Ras Shukair
15. Red Sea Reef
16. Qattara Depression

EGYPT'S PROTECTED AREA SYSTEM PLAN

From 1996 to 1998, the EU provided support for the National Protected Area Identification Mission to define the future shape and size of Egypt's Protected Area Network. The Mission conducted a systematic examination of potential and existing protected areas, identifying priorities and future needs. After discussion at a national workshop, the Mission's Report was formally adopted as the National System Plan for Protected Areas. The Mission proposed a total of 19 new protected areas for declaration which would nearly double the number of sites and their total area (Figure 1). Since then, three of these sites have been declared as Protected Areas: Siwa, the White Desert, and Wadi El Gemal National Park.

By 2017, the Protected Area Network may cover 180,000 km² or about 18% of the total land area of Egypt, a figure higher than that recommended by the IUCN as a target for national protected area coverage. Large protected areas reflect the fact that desert flora and fauna exist in low density over large ranges of territory.

Proposed protected areas have been identified and evaluated according to predefined criteria. The new additions focus upon habitats, natural regions and resources still under-represented in the Protected Area Network. The evaluation also looks at an area's potential for nature based economic activities. The proposed additions to the network greatly improve the coverage and representation of all recognized natural regions of Egypt, and include areas of important biodiversity resources.


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Table 2: Representation of habitat types

Habitat \ Protected area	Abu Galum	Ashtum El Gami	Burullus	Degla	El Ahrash	El Omayed	Elba	Hassana Dome	Nabaq	Nile Islands	Petrified Forest	Qarun	Ras Mohamed	Red Sea Islands	Saluga & Ghaza	Sanur Cave	Siwa	St Katherine	Taba	Wadi Allaqi	Wadi El Asluti	Wadi El Gemal	Wadi El Rayan	White Desert	Zaranik	Total no. of Protected Areas where habitat is represented
Mountain	■						■		■									■	■	■		■				7
Hill / plateau	■			■		■	■	■	■		■	■	■			■	■	■	■	■	■	■	■	■		18
Wadi	■			■			■		■				■				■	■	■	■				■		12
Serir / Hamada						■	■					■	■				■	■	■	■			■	■		10
Sand dune / sheet			■		■		■										■						■	■	■	7
Oasis																										6
Hatya							■										■	■	■				■	■		2
Med. coastal desert			■			■																		■		4
Fresh water swamp		■	■							■		■			■		■	■		■		■	■		■	10
Lake		■	■									■					■			■			■			6
River / canal			■							■		■			■											5
Saltmarsh	■	■	■			■	■		■			■	■	■			■					■			■	12
Mangrove							■		■				■	■			■					■				5
Sabkha /mud flats		■	■			■	■		■			■	■	■			■					■			■	11
Coral reef	■						■		■				■	■			■					■				6
Seagrass bed							■		■				■	■			■					■			■	5
Marine (Med.)			■			■			■																	3
Marine (Red Sea)	■						■		■				■	■								■				6
Marine island							■						■	■								■				4
Arable land			■		■	■				■		■			■		■			■	■		■		■	9
Total habitats/ Protected area	6	5	9	2	2	7	13	1	9	3	1	8	10	7	3	1	12	6	5	6	3	11	7	6	5	

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SELECTION CRITERIA FOR PROTECTED AREAS IN EGYPT

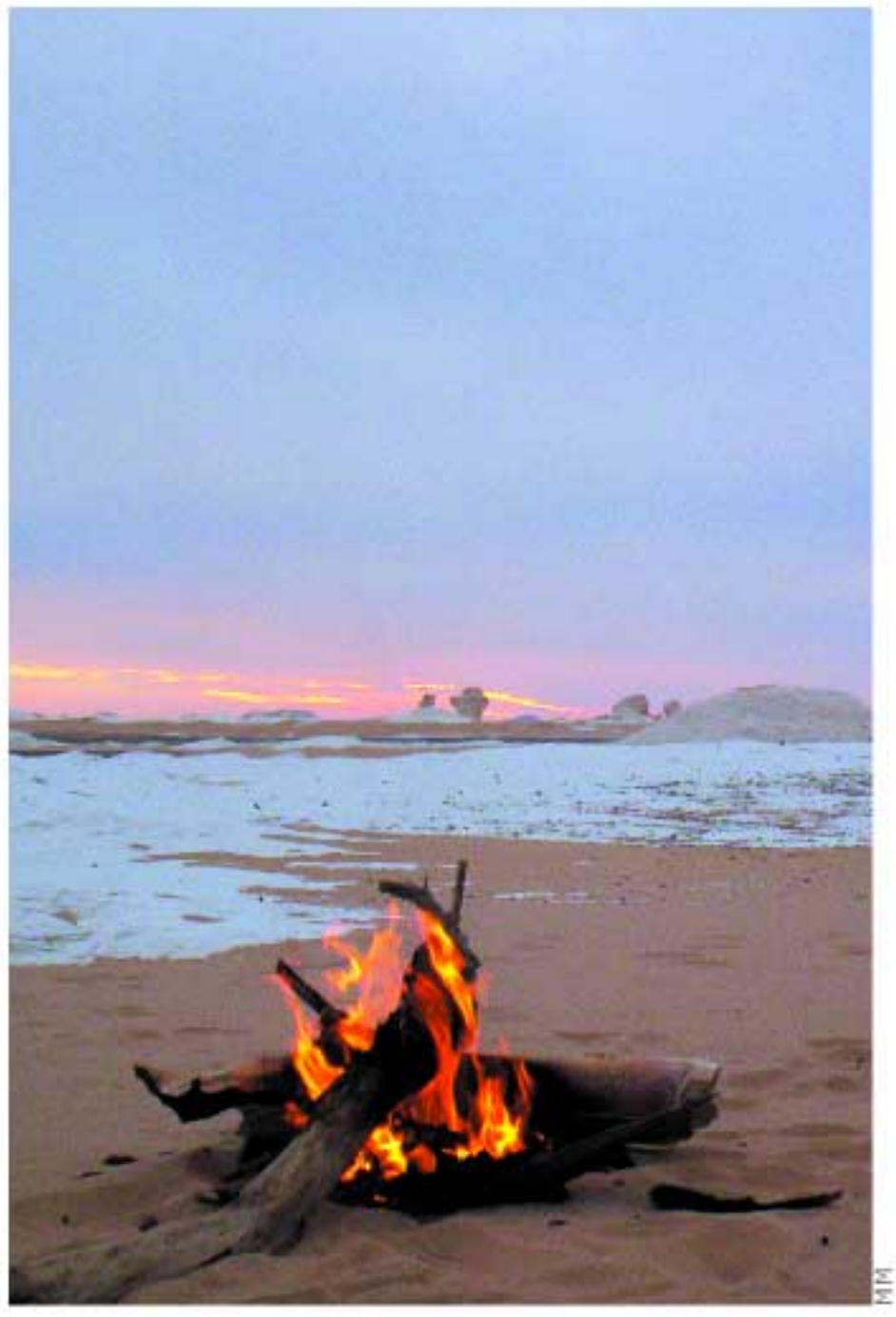
Declaration of new protected areas is determined by two main factors: the inherent value of the resource and the degree of threat to which it is exposed. The value of a site is judged by its integrity, significance for biodiversity conservation, contribution to the network of features not yet represented, and the site's potential for generating direct financial benefit for the nation and society as shown in Table 3.

OBJECTIVES FOR PROTECTED AREAS

In Egypt, as elsewhere in the world, protected areas are viewed as having intrinsic values. The primary objectives of the Protected Area Network in Egypt are:

* To conserve representative examples of the nation's natural habitats and physiographic regions;
* To help maintain the nation's biological diversity;
* To help maintain the nation's ecological viability;
* To optimize economic and social return from the nation's natural systems in a manner that insures their long-term sustainable use;
* To maintain options and choices for future generations.

In the relatively short time-span of some 20 years, Egypt has established a Protected Area Network that gives it a framework for pursuing the first three of these objectives. The coverage of habitat types and physiographic region types in the Network is shown in Tables 2 and 4.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SPECIES REPRESENTATION

In order to evaluate the Protected Areas Network in terms of species of flora and fauna represented in the Network, an extensive database of collected specimens and observations is required. The distribution of a species must be known in general and in fine detail in order that the right habitats and localities are included in any conservation strategy.

The BioMap project, funded by Italian Cooperation, began in 2004 and has as its major objective a national mapping scheme, tracking down and incorporating all Egyptian specimens in museums and collections and all Egyptian observations in publications and reports. Each individual plant or animal seen or found in collections is mapped as accurately as possible. By early 2006, about 200,000 records have been computerized and mapped using a GIS program. The maps will be freely available on the internet, allowing people to submit their records which, after expert scrutiny, will be entered into the database. This will encourage Egyptians to take an active role in conserving their natural heritage, and will also permit Egypt to benefit from the observations and research of international experts.

Table 3: Selection Criteria for protected areas in Egypt

Category	Criteria	Information used
■ Natural resource value ■ Biological value	■ High biological diversity. Importance for endangered, endemic or restricted range species ■ Importance for a significant population of a species. ■ Presence of representative / characteristic community.	■ Number of species. ■ Species presence or absence. ■ Density of various species / population of important species.
■ Habitat representation	■ The area contains characteristic habitats. ■ The site contains habitats that are not or are poorly represented in other existing or potential protected areas in Egypt.	■ Main habitats present. ■ Estimate of extent of habitat areas.
■ Structural / geologic value	■ Unique geologic and structural formations. ■ Presence of significant or unique fossil deposits. ■ Presence of historical or prehistoric artifacts.	■ Main geologic features. ■ Outstanding geologic/structural features. ■ Outstanding fossil deposits.
■ Cultural heritage value ■ Historical / archeological importance	■ Presence of historical ruins. ■ Historical significance.	■ Nature and type of artifacts / ruins. ■ Age of artifacts / ruins. ■ Size of site / volume of artifacts. ■ Condition of site and artifact.
■ Importance to traditional cultures	■ The area (and its resources) forms an important part of the traditional life style of a native population.	■ Presence of local traditional population. ■ Dependence of traditional population on natural environment in the area.
■ Human use value/ research opportunity	■ The area provides exceptional opportunities for the study of nature, environment and natural resources. The area can serve as a control to measure environ-mental change on a regional scale.	■ Intactness of natural habitats. ■ Uniqueness of ecosystems in the area. ■ Presence of rare, endangered or endemic taxa. ■ Accessibility. ■ Proximity to facilities.
■ Educational opportunity	■ The area provides exceptional opportunities for educating the public and students about nature, ecological processes and natural resource conservation. ■ The area contains exceptional natural resources,	■ Accessibility. ■ Proximity to urban centers. ■ Presence of "interesting" and "attractive" taxa. Presence of characteristic ecosystems.
■ Recreational value	features and outstanding natural beauty, that enhance human enjoyment and appreciation of nature. ■ The area is known and used as a recreational venue.	■ Accessibility. ■ Proximity to urban centers or other tourist attractions. ■ Presence of "interesting" and "attractive" taxa. ■ Presence of outstanding natural / geologic structures. Occurrence and intensity of current recreational use in the area.

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Category	Criteria	Information used
■ Economic value ■ Potential economic utility	■ The area (in its natural state) is, or has the potential to become a tourist and recreational attraction, and thus would benefit from conservation measures. ■ The area is an important natural propagation ground for commercially important taxa (such as fisheries, medicinal plants, etc.).	■ Occurrence and intensity of current recreational use in the area. ■ Accessibility. ■ Proximity to tourist facilities. ■ Proximity to other established tourist attractions. ■ High recreational and educational value (see above). ■ Commercially important taxa present in significant density. ■ Area is used for the harvesting of wild biological elements.
■ Urgency for protection ■ Condition of area	■ The current condition of the area. Past condition of the area.	■ Evidence of grazing / over grazing and fire wood collection. ■ Evidence of hunting. ■ Evidence of tampering with archeological sites. ■ Evidence of recent access (car tracks etc.). ■ Evidence of mutilation of landscape. ■ Presence of debris and man-made waste.
■ Degree of threat	■ The area is currently being degraded or there are plans to alter the current state of the site. ■ The site is potentially a subject for future alteration. ■ The site is in no foreseeable danger.	■ Evidence of degradation (see above). ■ Plans and indications to future development activities in the area.
■ Management concerns relationship with other programs or parties	■ Conflict of interest with other parties on area designation. ■ Potential for cooperation with other parties for optimal management of the area.	■ Other parties with common or conflicting interest (existing and potential). ■ Current land use in the area. ■ Planned land use. ■ Land ownership.
■ Enforcement potential	■ Potential success or failure in managing, monitoring and enforcing regulations.	■ Remoteness of area (accessibility). ■ Proximity to human settlements. ■ Presence of a local population. ■ Presence of resources which might require incompatible utilization of the area. ■ Occurrence and intensity of current negative uses. ■ Complexity of terrain. ■ Conflict with other management bodies.

Table 4: Representation of physiographic region types

Physiographic region / Protected area	Abu Galum	Ashtum El Gamil	Burullus	Degla	El Ahrash	El Omayed	Elba	Hassana Dome	Nabaq	Nile Islands	Petrified Forest	Qarun	Ras Mohamed	Red Sea Islands	Saluga & Ghazal	Sanur Cave	Siwa	St Katherine	Taba	Wadi Allaqi	Wadi El Asiuti	Wadi El Gemal	Wadi El Rayan	White Desert	Zaranik	Total no. of Protected Areas where habitat is represented
Suez Desert																										0
N. Eastern Desert Eocene Plateau																										3
C. Eastern Desert Eocene Plateau																										1
S. Eastern Desert Sandstone Plateau																										0
E. Desert Nubian Sandstone Plateau																										2
Red Sea Mountains																										3
Gebel Elba																										1
W. Desert Miocene Plateau																										4
W. Desert Eocene/Cretaceous Plat																										2
W. Desert Sandstone Plateau																										0
Gilf / Gebel Uweinat																										0
W. desert dunes																										3
Igma Plateau																										2
Central Sinai																										0
S. Sinai basement complex																										5
North Sinai dunes																										2
Mediterranean coast																										4
Red Sea coast																										6
Nile valley																										6
Total physiographic region / protected area	2	2	2	1	1	2	4	1	2	1	1	2	2	1	1	1	3	2	2	3	1	2	1	2	2	

Table 5: Number of globally endangered vertebrates and flora (according to IUCN 2002 Red List), showing proportion represented in the protected area network

Group	No. of endangered species in Egypt	No. of endangered species represented in PAs	% of endangered species represented in PAs
Flora	4	2	50
Reptiles	4	4	100
Birds*	9	5	56
Mammals	27	17	63

* only breeding and wintering species considered here.

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In the meantime, the number of endangered species is used as an indicator of species representation in the Protected Area network (Table 5). It has been determined that gaps in representation of endangered species of flora, birds and mammals are primarily due to limited coverage of the Western Mediterranean Coastal Desert, gaps which would be remedied by the future declaration of the Qasr and Sallum protected areas in Matruh Governorate. A project to assess a more extensive coastal and marine protected area in the Sallum area is currently under way in association with IUCN.


Mersa Shab (Elba) GM

GROWTH OF THE PROTECTED AREA NETWORK

The Protected Area Network witnessed its greatest expansion in terms of area in the late 1980's, increasing from a total of only 1088 km² in 1985 to 74,836 km² in 1989. This exponential growth was due largely to the addition of some of the largest protected areas in the country, such as Elba (35,000 km²), Wadi Allaqi (30,000 km²) and St. Katherine Protectorate (4350 km²). During the 1990's, growth in the Protected Area Network was moderate in terms of area, but several smaller sites were designated.


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CONVENTION ON BIODIVERSITY: WORK PROGRAM ON PROTECTED AREAS

The Nature Conservation Sector has adopted the Convention on Biodiversity's program of work as guidelines for management and development of Egypt's Protected Areas. In both unilateral and multilateral projects, the goals and targets of the work program are being pursued to build institutional management capacityfor appropriately staffed protected areas, to develop educational and awareness programs, and to enhance enforcement capacities.

The Nature Conservation Sector, with the size of the estate it is entrusted to manage, is re-examining its institutional and financial arrangements in order to increase its effectiveness in managing Egypt's Protected Areas in partnership with all stakeholders involved in conserving and using our natural heritage sustainably. There remain great discrepancies in the levels of management, infrastructure, financing, staffing and programs within the Protected Areas Network.

This report discusses the primary issues facing the NCS, along with its accomplishments and lessons learned during its twenty years of work.

PART II

Managing and Financing Protected Areas in Egypt

Protected Areas have been the backbone and main instrument for nature conservation in Egypt over the past twenty years. The protection of critical habitats by establishing and managing a national system of Protected Areas has proven to be the most effective and efficient tool for preserving Egypt's natural heritage and resources on a sustainable basis.

The Nature Conservation Sector of the EEAA is responsible for managing Protected Areas. It presently comprises of two sub-departments, the Protected Areas Management Department overseeing the Protected Area Network, and the Biodiversity Department which provides information, systematic studies and other services. The NSC's structure and administration are currently being reformed.

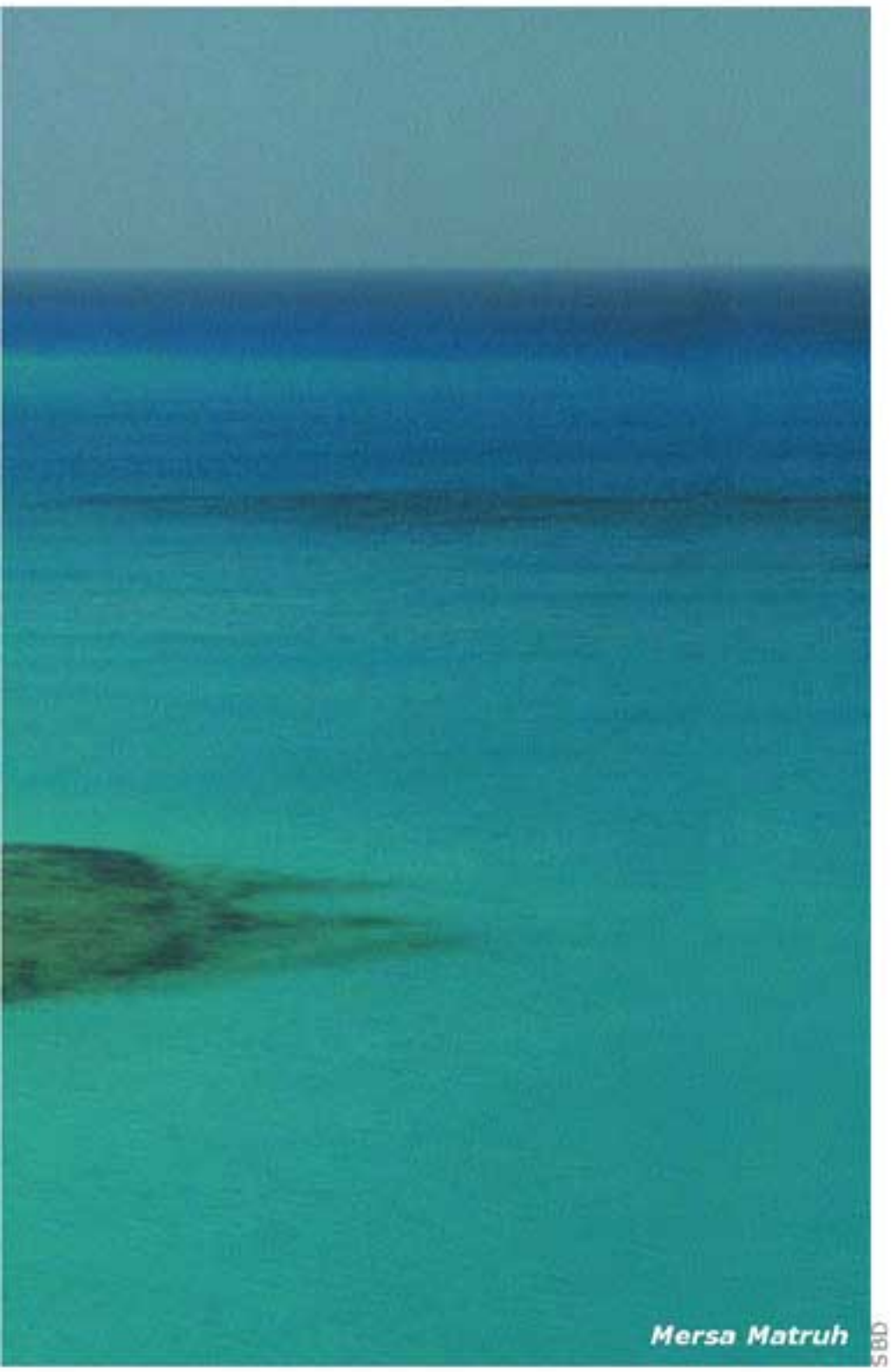
ADMINISTRATION

The Director of the Protected Area Department, based in Cairo, oversees management of the national network and reports to the Director of the Nature Conservation Sector. The National Protected Area Network eventually will be subdivided into geographical units or sectors, with a central office managing the protected areas in a particular geographical area.

A Manager is appointed for each Protected Area. Rangers with backgrounds in various academic fields and work experience are hired to staff the Protected Areas and are given the rank of senior or junior ranger depending upon their qualifications and level of experience. Community guards hired from local populations living in or adjacent to the Protected Area work with the rangers and complement their activities. Other people are hired as needed, including Egyptian and foreign consultants, to provide technical and scientific services.

Staff

The staff of the Protected Areas are the primary and most valuable resource of the NCS. Since the creation of the Ras Muhammad National park in 1989, the recruitment of a qualified cadre of rangers to staff the Protected Areas has been a primary task of NCS management.



Mersa Matruh SBD

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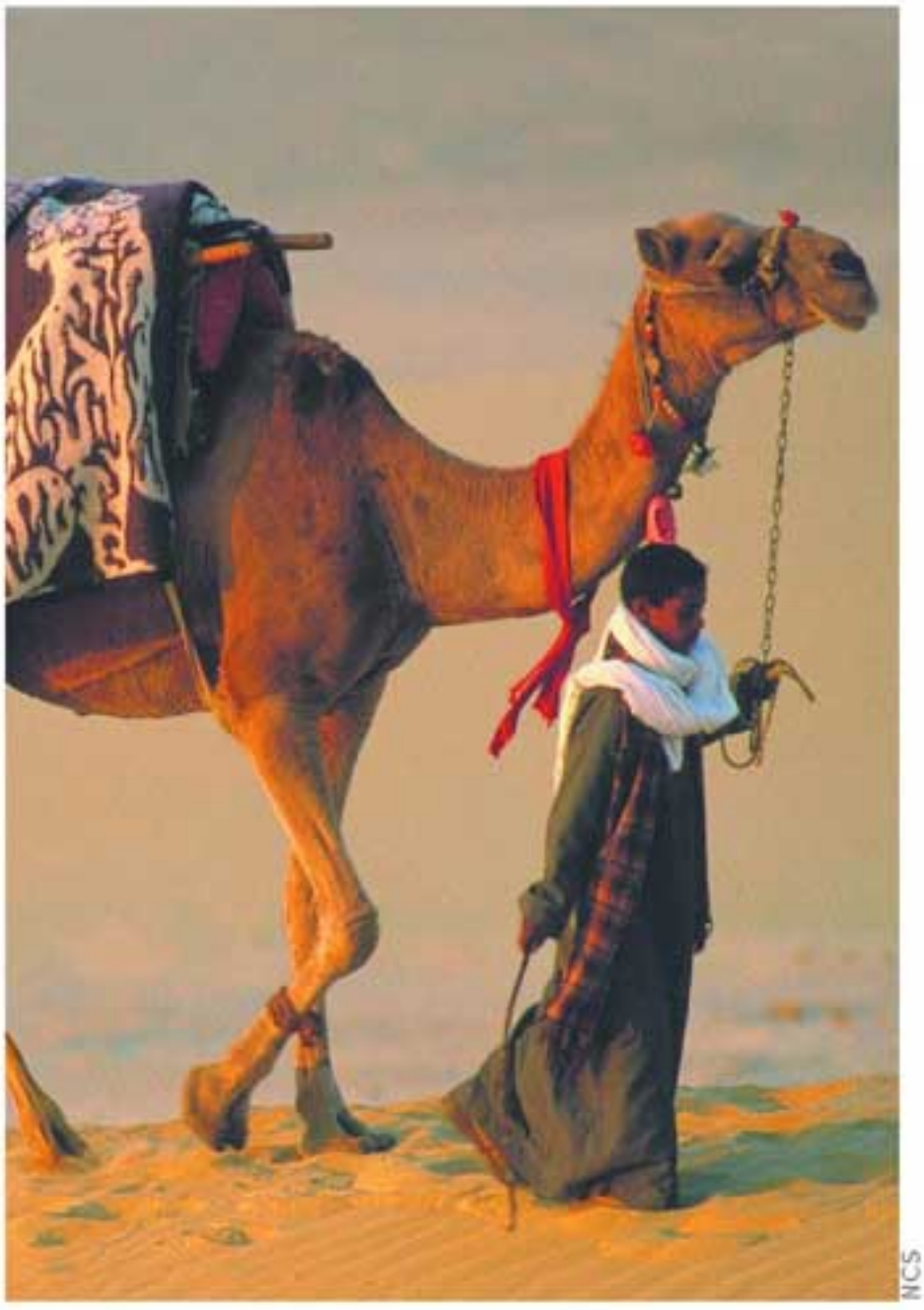
Rangers include zoologists, botanists, geologists, anthropologists, medical doctors andveterinarians, but in addition to their own fields of specializaiton, they undertake a wide range of tasks including law enforcement, administration, monitoring and research, as well as education and public relations. Recently, there has been increasing attention given to career development within the NCS, and several rangers with extensive experience have been promoted to the level of Protected Area Manager.

Training has been, and continues to be, the primary means of developing the capacity of Protected Area managers, rangers and other staff. Many have received training in Egypt and abroad, and several have obtained PhDs or Master's Degrees. Training modules have been developed at the National Training Center in Sharm El Sheikh for programs serving various staff levels. Budgeting for far more training activities is a priority in current planning. Early in 2006, a training needs assessment was made to identify generic and specific training needs and priorities for the entire staff of the NCS.

The global average of protected area staffing is 27 staff per 1000 km^2 (IUCN 1999), while the average for Africa is 70 staff per 1000 km^2. In Egypt, the number is 5.3 staff per 1000 km^2, far below the international, and African, average. Also, staffing levels are extremely variable, with 0.45 staff per 1000 km^2 at Elba, Egypt's largest Protected Area, to a fairly high density at some of the smaller, older areas.

NCS staff now number about 500 persons. According to world standards, the manpower required to meet conservation efforts in an area the size of Egypt's protected areas estate is at least five times that number. Salaries and wages expenditures have increased from the year 2000 to 2005 to reach over 50% of the total budget received by the NCS. This factor has affected its budgets for investment, operating and maintenance costs.



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COMMUNITY GUARDS

A staffing solution that is unique in the Egyptian experience of managing protected areas, pioneered at St. Katherine Protectorate, is the employment of community guards who are indigenous inhabitants of the protected area. There are now community guards in seven other protected areas. Community guards bring invaluable knowledge of the protected area to NCS management, and ensure that communication channels between the NCS and local communities are open, dynamic and

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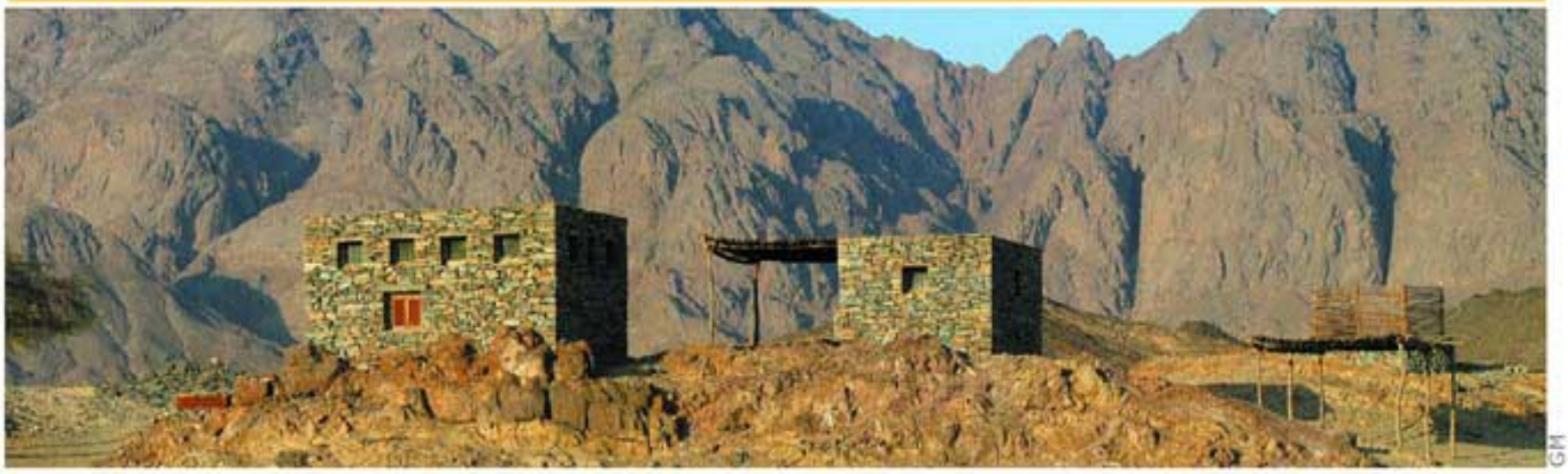
creative. In this way, local communities are encouraged to cooperate with and benefit from protected area management

MANAGEMENT RESOURCES

A wide range of facilities and infrastructure has been developed in Protected Areas to support management. Offices, accommodations for staff, and workshops have been established in many of the Protected Areas. The National Training Center in Sharm El Sheikh is an important addition to the NCS infrastructure, but its facilities deserve far more intensive use. To this end a review was completed in early 2006 to identify how the Centre could be developed as a regional centre of training excellence.

Box 2: Eco-architecture



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In recognition that each Protected Area is unique the NCS has actively promoted design solutions for its infrastructure that reflect the Park's setting. Designs should be in harmony with nature and where possible typify the vernacular architectural traditions. Furthermore the infrastructure should if possible use local materials and involve local people in their construction and maintenance. Some of the best examples of this approach are the ranger outposts, information post and park entrances built for Wadi El Gemal National Park.

These simple rustic structures were built using a dry stone technique with minimal use of cement, a building tradition that extends back over 2000 years. The structures have a minimal physical footprint on the site, blend with the landscape, use natural cooling systems and were built by local people. It is hoped that these structures will serve as a demonstration model for sustainable building techniques and heighten awareness of the possibilities for environmentally sensitive design and fabrication elsewhere in Egypt.

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MANAGEMENT PLANNING

Most of the Protected Areas have been provided with basic office and field equipment such as vehicles, boats, communications equipment, computers, GPS, binoculars, cameras, specialized equipment for boat moorings, laboratories, public education materials, etc. Maintaining and upgrading this equipment is a primary concern of Protected Area management teams. Inadequate budgets, as well as inadequate staff in most Protected Areas, are of course reflected in uneven distribution of facilities and equipment among the Protected Areas.

Management of protected areas involves a surprisingly large and varied number of stakeholders. The GOE, which has considerable powers in determining land use policies, steers its way between economic, military and social demands. The economic sector, public and private, has a great appetite for land and resources ownership and exploitation. The scientific and other sectors of Egyptian society now take an increasing interest in the conservation and use of our natural resources. Egypt has chosen to treat its natural lands and waters as resources deserving management that conserves biodiversity and other natural values while yielding economic returns that can compete with other possible uses. For the NCS, this translates into a mandate for conservation of natural resources using every appropriate means, from scientific study to encouragement of tourism and forming partnerships with local inhabitants and other stakeholders, who must share, and balance, their various ambitions.

Table 6: NCS Management Effectiveness Evaluation

Context and policies	PA Design and planning	Inputs	Management processes	Management outputs*
Strengths	Strengths	Strengths	Strengths	Strengths
The PA System has high biological importance and representation.	The PAs generally are meeting their conservation objectives	Staff technical skills and performance are generally good	Management planning capacity is generally good	Threat detection to the system is good
It is socio-economically important but many benefits are unrealised.	The PAs are well configured and zoned to meet their objectives	Communication and educational programmes are satisfactory	Decision-making is collaborative and transparent with partners	Visitor and tourist activities are managed
	The PAs have binding legal security			Staff monitoring, supervision and evaluation occurs
Weaknesses	Weaknesses	Weaknesses	Weaknesses	Weaknesses
Serious pressures and threats from land use changes and recreation	Many PAs have land ownership disputes	Unacceptably low level of funding is the most serious weakness	Management plans are not being implemented	Threats are detected, fines or other punishments are levied, but the law is then not applied
The system is vulnerable to illegal activities and low law enforcement	Legal enforcement is poor.	Staff levels are too low	Management actions are not informed by research and monitoring programmes.	Infrastructure development is inadequate
The system suffers from an inadequate policy framework	Local communities are not very supportive	Training opportunities are inadequate		Staff training and career development is poor
	EIAs are poorly enforced and buffer zones are not adequately regulated.	PA equipment resources/ infrastructure - inadequate		
		Arrangements for visitor safety are poor		

* specific products and services accomplished by PAMU staff, and evaluated relative to threats and pressures, PA objectives and work plans.

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Egypt did not pay adequate attention to preparing management plans for its protected areas until very recently. To start the process, a workshop was held with Italian Cooperation and IUCN support in May 2002 for formulating guidelines for protected area management plans.

In an effort to understand their own strengths and weaknesses, in January 2006, the NCS staff undertook a rapid assessment of the management effectiveness of Egypt's protected area system. The findings revealed many areas of management that need reform, beginning with institutional autonomy at the national level (Table 6).

Management objectives and policies are formulated to reflect national policies and priorities, as well as the local circumstances and needs of each Protected Area. Egypt has adopted the IUCN categories of usage for protected areas, and together with management policies identified as relevant to a particular protected area, priority actions are identified as quickly as possible, such as those that deal with present threats, enhance or regulate resource use, or respond to easily seen opportunities. After deciding how to deal with immediate needs, the management plans are further elaborated, tested, and subjected to constant revision.

Now as a policy the staff of each protectorate, in cooperation with other stakeholders, are required to draft a management plan, using the guidelines developed at the 2002 workshop, as well as the experience and lessons learned in other protected area. At this time there are thirteen Protected Areas with fully developed or functional management plans.

MANAGEMENT TOOLS FOR PROTECTED AREAS

Protected Area management employs the standard tools used in such areas all over the world: patrolling and monitoring by rangers and others; reporting to central management and evaluating results; issuing licenses and permits for activities that need to be regulated; promoting public awareness and education at all levels of interaction, from local communities to visitors to the areas, to the general public and beyond.

Several management tools have proven especially useful. Zoning has been found to be a useful tool for management planning in a large Protected Area. The area is classified according to its need for protection, the level or intensity of management required, and the area's capacity, or part of the area's capacity, to sustain traditional, public or commercial use or a combination of these. The scheme provides guidelines for management actions and helps to resolve conflicts that arise when various stakeholders and the NCS seek to both utilize and conserve the same resource base. Zoning also helps management designate areas for specific activities such as scientific research, recreation, ecotourism, quarrying or fishing.

Table 7: Protected Areas Zoning Scheme

Name of zone	Management input	Permissible impact level
1. Strict natural zone	low - moderate	zero impact
2. Premium wilderness zone 3. No-take zone	moderate	low impact
4. Recreational zone 5. Archaeological protection zone 6. Traditional use zone	high	moderate impact
7. Multiple use zone 8. Adjacent area (Buffer zone)	high	high impact

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Based on the zoning scheme, site planning has been pioneered in the Wadi El Gemal National Park (WGNP) to provide specific and detailed management guidance for small, discrete sites that are of particular concern due to their conservation importance or sensitivity to human pressures (Table 7). The zoning scheme is particularly relevant to this large protected area and action plans have been prepared for species that are endangered or of particular concern because of their popularity with visitors, such as marine turtles, dugong, dolphins and gazelles.

A general conservation management plan for Wadi El Gemal National Park was adopted in March 2004, but the park's size makes it impractical to provide detailed management plans for the whole area in one document. Those parts of the area that have sites of significant biological value or sensitivity, and which may be subject to heavy visitation, have site specific plans that provide guidelines for visitor use, traditional uses of the areas by local people, and special uses such as ecotourism.

Geographic Information Systems (GIS) are a comparatively new, and increasingly useful, tool for compiling, correlating and interpreting spatial data. The NCS central administration and several Protected Area management teams are developing their capacities for GIS monitoring and using its applications in mapping and tracking human uses and impacts, as well as in mapping flora and fauna.

Box 3: Site planning, Wadi El Gemal National Park

Wadi El Gemal Island, Ras Baghdadi, their contiguous offshore waters, and the downstream part of Wadi El Gemal, are geographically and ecologically linked, extending over some 28 km^2. These, as well as the Qula'an and Sikeit areas, for which site plans are being developed, include some of the most sensitive and high value conservation areas within the WGNP. Most of the sites are easily accessible from the Red Sea highway or by boat and are already attracting large numbers of visitors. The plans aim to find a balance between tourism, commercial access and the Ababda people's traditional, non-motorized fishing activities, and the conservation of biological and aesthetic values. Management plans include regulating visits to Wadi El Gemal Island, especially during Sooty Falcon nesting (May-September), regular patrolling and monitoring; reserving Ras Baghdadi waters for local Ababda fishermen; prohibiting collection of shellfish; limiting the speed of motor boats; designating trails for visitors and limiting persons per group; slowing traffic in the 500 meters of highway bisecting wildlife corridors between the main wadi and the Ras Baghdadi delta.

Box 4: GIS monitoring of grazing animals

A project is underway in the St. Katherine area that uses GIS/GPS techniques to record the movements of domestic goats and sheep by fitting the animals with GPS receivers. Along with direct observations of the plant preferences of the animals and the amounts they eat, the results are entered on a terrain model, which will give researchers a more accurate picture of animal grazing and the vegetation available. This work is being done with the help of local communities so that they can participate in decisions concerning how to optimize sustainable use of their environment.

Box 5: Egyptian tortoise conservation

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The critically endangered Egyptian Tortoise is found along the Mediterranean coast from Libya to the western border of Egypt. Reduced to near extinction by an uncontrolled pet trade, its remaining habitat is also threatened by agriculture, overgrazing and tourism development. In 1997, a coalition of partners began a conservation effort that included captive breeding. A pilot conservation program within the Zaranik Protected Area and education and development programs with local communities fostered support and gave local people a stake in tortoise survival. A handcrafts project brought significant economic benefits to the area's families, especially women. As a result of this project and the close relations developed between NCS staff and the local community, a small relict population of tortoises was rediscovered in Zaranik in 2000. A community guard who is a local resident now leads the monitoring and study of this wild population in collaboration with an Egyptian post-doctoral researcher. Using the scientific data gathered at Zaranik and the experiences in building community partnerships, the small tortoise population recently reported in the Omayad Biosphere Reserve in the Western Desert may also offer the possibility of establishing an in-situ population for breeding and reintroduction.

Box 6: Acacia propagation

A program was begun in 2000 to investigate the failure of *Acacia tortilis* and *Acacia raddiana* to regenerate. Acacia seeds from both species were collected from the wild by local Bedouins and gardens were established at 60 Bedouin households for growing seedlings. Also monitoring enclosures were constructed in some of the main wadis to protect adult Acacias and their growth is measured to compare with trees outside the enclosures. Later 30,000 of the Acacia seedlings that had been raised by the local Bedouins were planted in five wadis in the St. Katherine Protectorate, with palm leaf boxes as protection from grazing and for shade. These seedlings were tended by local Bedouins and the survival rate of the seedlings in the first two years was a quite remarkable 60%. Growth data, soil analysis, meteorological data, grazing study results and other related data have been entered into a GIS database program for monitoring progress.

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HABITAT AND SPECIES REAHBILITATION

In the course of managing protected areas to preserve habitats or to prevent degradation of habitats, the NCS undertakes proactive conservation actions through habitat and species conservation and rehabilitation programs. In some areas there may be a need, and opportunity, to restore a habitat or to reintroduce a species to places where it has been reduced in numbers, or threatened, by human activities.

Efforts have been developed to preserve the Egyptian tortoise *Testudo kleinmanni* from habitat loss and possible extinction. In the St. Katherine Protectorate, Bedouin communities realized that very few young Acacia were found and a rehabilitation program started. Research and rehabilitation programes have also been

established for impacted coral reefs, with the help of University of Essen, and for mangroves on the Red Sea coast in co-operation with FAO.

Financing Protected Areas

WORLD NORMS

A United Nations Environmental Program (UNEP) Monitoring Center survey conducted in 1999 recommended that the minimum investment for sustainable protectorate management should be around $520/km² per year. In Egypt the total expenditure on Protected Areas, including staff costs, averages $19/km² per year, which is only 11% of the average for developing countries, and about 9% of the minimum in most African countries.

NCS BUDGET ALLOCATIONS AND REVENUES

Law 4 of 1994, which established the Nature Conservation Sector, also established the Environmental Protection Fund (EPF) which receives all revenues generated by protected areas: entrance fees, concessions income, penalties, and other revenues such as permits to film inside protectorates. The salaries of some 170 NCS staff formerly hired on a contract basis were provided by the EPF.

Of the 24 Protected Areas that now cover approximately 98,000 km², only a few are currently generating revenues. There are six protectorates that have visitor fees (Table 8). The revenues generated by protected areas over the period 2000-2005 reached LE 67 million and $7.3 million, equivalent to over LE 100 million. This figure is skewed by penalties for damages collected primarily in 2001-2002 so that the total, without these "windfall earnings," is around LE 67 million.

During the same period, EEAA budget allocations to the NCS have decreased from LE 16.7 million in 2002-2003 to LE 11.5 million in 2004-2005 (Table 9). The wages bill for NCS staff has grown as a percentage of total budgets allocated to the NCS, at the expense of funds available for investment and operating costs.

Table 8: Annual revenue of protectorates 2000-2005

		2000/1		2001/2		2002/3		2003/4		2004/5		Total 2000-2005	
Protectorate	Visitor fee**	LE	$	LE	$	LE	$	LE	$	LE	$	LE	$
Entrance fees		3,903,048											
Ras Mohamed	$5/LE5	390,220	240,916	4,147,416	166,563	6,452,853	62,631	11,555,000	42,080	10,153,929	200,223	36,212,246	712,413
Nabaq	$5/LE5		15,714	307,785	9,438	386,519	3,775	476,000	3,546	382,443	3,520	1,942,967	35,993
St. Katherine's	$3/LE3	99,250								2,113,843	139,821	2,113,843	139,821
Wadi El Rayan	LE5/LE1	2,563		108,250		96,450		125,000		99,750		528,700	
Al Zaraniq	$3/LE3	974,764	32	1,869	10	289	9			2,581		7,302	51
Red Sea	$2/LE2	5,369,846	251,104	1,945,837	29,557	2,117,398	8,483	4,557,716	12,284	6,640,043	114,829	16,235,758	416,257
Total			507,766	6,511,157	205,568	9,053,509	74,898	16,713,716	57,910	19,392,589	458,393	57,040,817	1,304,535
Concessions													
Nabaq						29,620		136,787		59,240		225,647	
Wadi El Rayan		49,600		191,600		24,116		110,777		201,335		577,428	
Red Sea		94,500		84,700		155,670		147,487		246,172		728,529	
St. Katherine's		33,600								5,808		39,408	
Other				61,777		93,656		67,566		122,778		345,777	
Total		177,700		338,077		303,062		462,617		635,333		1,916,789	
Hunting		19,812		3,750				2,878		1,820		28,260	
Penalties		7,307,140	4,000	841,980								8,149,120	6,004,000
Other		28,433	500	62,188	6,000,000	22,000		80,000		54,176		246,797	5000
Total		12,902,931	512,266	7,757,152	6,205,568	9,378,571	74,898	17,259,211	57,910	20,083,918	458,393	67,381,783	7,309,035
$ =LE*		3.86		4.51		6.03		6.22		5.85			
LE equivelant		12,902,931 / 1,977,347		7,757,152 / 27,987,112		9,378,571 / 451,635		17,259,211 / 360,200		20,083,918 / 2,681,599		67,381,783 /33,457,893	
Total		**14,880,277**		**35,744,264**		**9,830,206**		**17,619,411**		**22,765,517**		**100,839,675**	

* End of period exchange rate

** Egyptian and foriegner rates

Source : Ministry of Foreign Trade, Monthly Digest, Egyptian Environmental Affairs Agency

Table 9: Annual budget vs. expenditure of NCS (2000 - 2005)

	1/7/2000-30/6/2001	1/7/2001-30/6/2002	1/7/2002-30/6/2003	1/7/2003-30/6/2004	1/7/2004-30/6/2005
Budget	4.85	6.91	16.74	14.05	11.48
Expenditure	15.56	9.55	12.02	11.51	10.02
Actual/budget	3.21	1.38	0.72	0.82	0.87

Source Egyptian Environmental Affairs Agency

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ESTABLISHMENT OF THE NCS AS AN AUTONOMOUS AGENCY

One of the most important recommendations of the First Egyptian International Conference on Protected Areas and Sustainable Development (October 2002) was that the NCS should be made an autonomous agency under the Ministry of Environmental Affairs.

In Phase II of the Egyptian Italian Environmental Cooperation Program (EIECP), in conjunction with IUCN, the NCS has been engaged in capacity building programs leading to institutional restructuring. The institutional structures and financial arrangements now being developed will give the NCS far more capacity to improve management of the Protected Areas, secure their ecological integrity, provide new investment opportunities, support nature based tourism in Egypt, and contribute to the alleviation of rural poverty.

In a brief prepared for a roundtable discussion attended by key government and other sector leaders, justifications for reforming Egypt's nature conservation institutions were presented:

1. bureaucracy in a line ministry inhibits management, including financial flexibility and decision taking;
2. government salaries and working conditions fail to attract and retain high caliber and committed staff;
3. operating budgets are too low for proper protection and management of protected areas;
4. civil service staff's operational methods impede progress in the kinds of work required in protected area management;
5. public service structures do not efficiently support the protected area agency.

While some protectorates' revenue generating capacities, such as Ras Muhammad National Park and St. Katherine Protectorate, are much higher than others, it is recommended that a high proportion of revenues generated in a specific protected area should be spent in the same area. This would give an incentive to protectorate managers to improve fee collection, to be more creative in generating income, and would show Egyptian and foreign visitors that the fees they pay are being used for conservation in the area they are visiting. Tables 8 and 9 show that revenues generated by protected areas in the period 2000-2005 were almost double budget allocated for protected areas. In essence the protected areas have been subsidizing other government activities.

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Box 7: Red Sea mooring system


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Red Sea coral reefs include an extensive fringing reef along 80% of the Egyptian mainland coast, while other fringing reefs lie along the margins of various island groups. The submerged reefs associated with these islands and other shallow sub littoral areas are the sites of ever increasing tourist diving activities. It is estimated that nearly one million divers and snorkelers visit the Red Sea each year. Surprisingly, most of the Red Sea reefs are not suitable for tourist use because of their physical setting or distance from tourist accommodations, which has caused heavy environmental pressures on the most popular sites. Throughout the 1990's, environmentally sound mooring systems were developed by partnerships formed among the dive industry, the EEAA, and an NGO, HEPCA (Hurghada Environmental Protection Community Association). The Red Sea now has more than 1,000 environmental moorings, which is the largest installed mooring system in the world. A mooring buoy pilot program, carried out within the framework of the EEAA-USAID Red Sea support program, undertakes moorings maintenance, makes new installations, and seeks solutions to management and technical problems.

The revenue generating potential of the Protected Areas means that the NCS could be largely self sustaining even at the higher levels of expenditures that will be required for improved management. Currently, expenditures are irregular and are concentrated upon some protectorates to the neglect of others. Some Protected Areas receive millions of visitors and have received relatively large budgets, while some more isolated areas received small budgets or none at all.

The NCS is presently engaged in multiple tasks that will enable it to develop its revenues, manage all of the Protected Areas more efficiently, plan and manage increased expenditures for investments in infrastructure and operating costs, and increase its staff.

DONOR FUNDED PROJECTS

International assistance has played a large part in the development of Egypt's Protected Area Network. Since 1989 some 14 major projects have been carried out in cooperation with the GOE to develop Egypt's capacities in protected area management. Most of these projects have aimed at establishing or strengthening the management of a particular protected area or sector (e.g., Ras Muhammad National Park, St. Katherine Protectorate, the Red Sea coast and islands), and their budgets and expenditures must be evaluated apart from the basic issues of budgeting, expenditure, revenue distribution and management of the entire network.

While it is in the interest of the NCS to have trained Egyptian nationals staffing these projects, there is also a continuing need to study models of protected area management, especially those developed in other African and Middle Eastern countries. Staff training programs and career development, through higher studies both in Egypt and abroad related to these projects, have been central for the development of qualified personnel and the success of these projects.

During the past fifteen years, donor funded projects were instrumental in establishing infrastructure and management for Protected Areas that were considered both highly vulnerable to increased human impacts (largely from tourism) and also most important economically (due to tourism). The benefits of these projects, both in infrastructure and training of NCS staff, must be secured and continued through programs that follow these projects.

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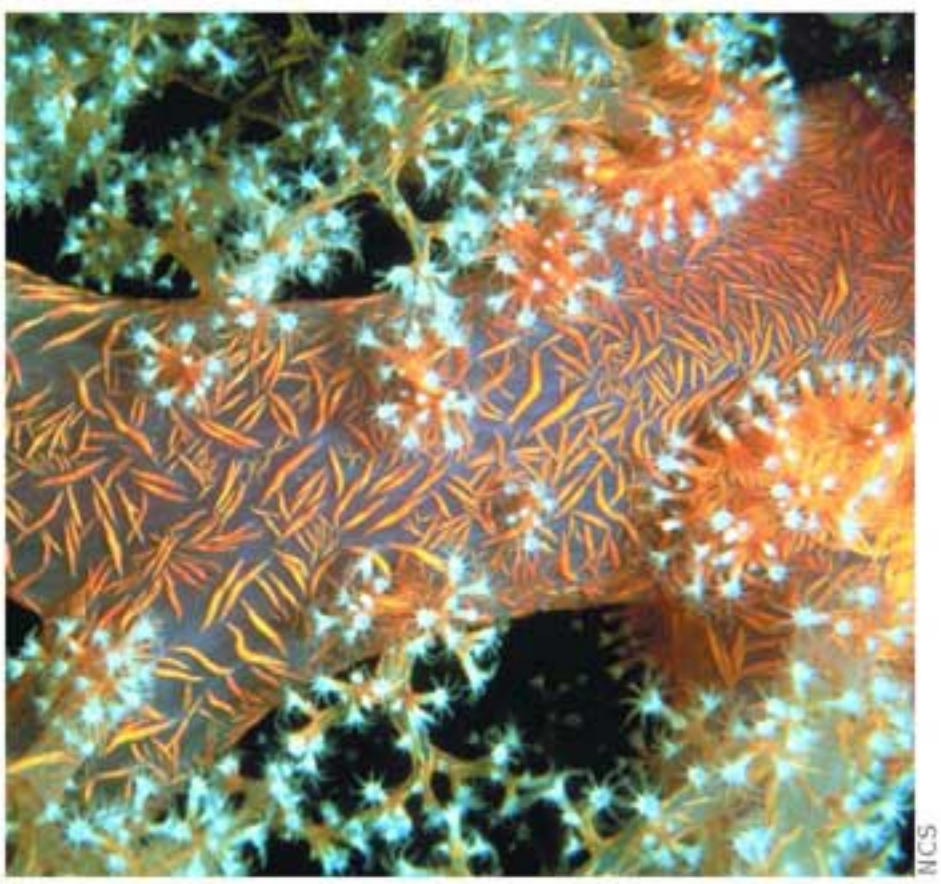

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GULF OF AQABA PROTECTED AREA DEVELOPMENT PROJECT

The EU supported projects in South Sinai from 1989 to 2003. The initial project to develop management and infrastructure at Ras Muhammad National Park set high standards for protected area development in Egypt. This project was expanded in 1996 to include development of the South Sinai Sector, and further expanded as the Gulf of Aqaba Protected Area Development Project as the newly declared areas of Nabq, Abu Galum and Taba in the northern Aqaba Gulf were included. In addition, it helped fund the national training center at Sharm El Sheikh for training programs in protected area management.

In 1996, a parallel project advanced the St. Katherine Protectorate from "paper park" to a world class Protectorate, paving the way for its declaration as a UNESCO World Cultural Heritage Site. Local community participation was an integral component of this project. In order to gain support of Bedouin residents of South Sinai, innovative community based programs in health and veterinary care, handcraft development and marketing, and ecotourism were instituted along with the selective employment of local residents as community guards and support staff in all areas of the Protectorate.

The EU also supported a year-long mission to visit and assess every area of the country in order to develop systematic criteria for choosing areas to be recommended for protected area status.

SBD

RED SEA AREA DEVELOPMENT PROJECTS

In the 1990s the Global Environmental Facility supported a programme for environmental surveys of the Red Sea coast and littoral. The project resulted in a rich data base on the ecology, natural resources, biodiversity and land use of the area.

The U.S. Agency for International Development (USAID) has been involved with protected areas in the Red Sea region since 1994. The first project, the Red Sea Sustainable Tourism Initiative,(RSSTI) established a management system, monitoring program, and boat mooring system for the protected Red Sea islands. These efforts were expanded under the Egyptian Environment Policy Program (EEPP) to develop management plans for the proposed Great Red Sea Marine Park. Working in cooperation with the Red Sea Governorate, the project focused on development and management of the existing Red Sea islands and mangrove protected areas, enhancing law enforcement, monitoring, maintaining mooring facilities, managing fee collection and raising public awareness.

The activities currently in progress as the LIFE Red Sea project include promotion of natural and cultural tourism and engaging local Red Sea inhabitants in the economic, social and cultural benefits generated by tourism. The primary partners in the project are the EEAA, the Tourism Development Authority, and the Red Sea Governorate.

MEDITERRANEAN WETLANDS - MEDWET PROJECT

The MedWet programme originated from the Grado Conference in 1991. MedWet promotes the protection of wetlands in six Mediterranean countries through a combination of innovative land-use and wetland policies at national level, site protection and management at local level and regional networking and exchange of experience

In Egypt MedWet project activities focus on 3 protected areas on the Mediterranean: Zaranik, Burullus and Omayed.

Zaranik on the North Sinai coast lies on the eastern end of Lake Bardawil and is a very important site for migratory water birds passing through the Eastern Mediterranean region. Lake Bardawil is registered as a RAMSAR site due to its international importance for waterfowl populations. Lake Burullus contains both fresh and brackish water habitats and is an internationally important wintering and breeding site for waterbirds, and is also a RAMSAR site. Omayed encompasses a section of the Mediterranean coast and has a rich terrestrial biodiversity including populations of several endangered small mammals and reptiles.

The Egyptian MedWet project started in 1999 co-funded by a GEF grant and in kind GoE contributions and is scheduled to conclude in 2006. Its objective is to create or enhance structures for the management of wetlands through: Establishment of inter-ministerial coordination mechanisms for projects undertaken at the local and national levels; developing demonstration activities at the


Wadi Rayan NCS

most significant sites; awareness-raising, training and networking of local communities and key social and economic actors, as well as, establishing linkages between them along the Mediterranean. At site level mechanisms for taking account of local concerns and ensuring local participation and economic returns are built into the project from the outset. One of the primary outputs of this project is the promulgation of a National Strategy for Wetland Conservation.


DP

WADI EL RAYAN PROTECTED AREA DEVELOPMENT PROJECT

The Italian Government, through the Italian Development Cooperation agency (IDC) with technical assistance from the IUCN has been a leading contributor to development of Egypt's protected areas. The Wadi El Rayan area is one of the most highly threatened reserves in the country, primarily due to its proximity to Cairo but also to the very sensitive nature of its desert flora, fauna and fossil deposits. As well as developing management and infrastructure, this project has generated several innovative subprojects that are of great interest to other protected areas, including the management experience gained as a result of the inscription of Wadi El Hitan marine fossil area as a World Heritage Site. Local residents of the Lake Qarun area of Fayum Governorate are being helped to develop skills in guiding visitors in the area, which includes many important areas for birds, and developing facilities for tourists such as ecolodges.


Wadi Rayan

VA

SIWA AMELIORATION PROJECT

An Italian Cooperation project undertook preliminary studies that led to declaration of the Siwa Protected Area in 2002. The second phase of this project aims at consolidating the management of the area and promoting sustainable uses of the region's resources, primarily through nature and culture based tourism.


NCS

INSTITUTIONAL REFORM OF THE NATURE CONSERVATION SECTOR

A multi-faceted project is in progress involving the Italian Cooperation. IUCN and the UNDP, consisting of several structured efforts to improve the capacities and organizational structures of the NCS at the national level in order to better meet management and financial needs of the Protected Area Network. This is a holistic institutional reform process aimed at developing visions, policy platforms and action agendas for the NCS. Examination of the current status of Protected Area management, funding and mechanisms to ensure sustained funding, as well the application of business principles to Protected Area management, are key components of this project.


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PART III

Values of Protected Areas: Developing Partnerships


Siwa

As elsewhere in the world, protected areas in Egypt are viewed as having intrinsic values. While there may be tangible benefits from protected areas, other benefits are more difficult to measure and calculate in real terms. Increasingly, it is being realized that the role of protected areas goes beyond that of conserving biodiversity and safeguarding valuable resources. In the course of the last twenty years we have learnt that well-managed protected areas help underpin sustainable development. Egypt's protected areas provide a wide range of services and benefits that contribute to the social and economic development of local communities and the nation as a whole.


Lake Nasser (Wadi Allaqi)

MBD

PROTECTED AREAS CONSERVE VITAL ECOLOGICAL SYSTEMS AND PROCESSES

Egypt's Protected Area Network helps ensure sound and smooth functioning of the natural systems and processes that sustain the nation. Like the rest of the world, Egypt is facing new and difficult environmental challenges which will be exacerbated by the uncertainties of climate change. The increasing loss of Egypt's biodiversity combined with ongoing desertification and land degradation all contribute to the reduction of nation's natural productivity. However by maintaining ecological processes in protected areas the natural resilience of Egypt's resource base can be preserved and options for later remedial action and economic development can be retained that would otherwise be lost.

Protected Areas conserve ecosystems, habitats, food chains and individual species which perform vital tasks such as producing oxygen, purifying water, protecting watersheds, stabilizing soil, serving as breeding grounds and nurseries, and providing food sources for a host of living organisms.

PROTECTED AREAS ARE STOREHOUSES OF BIO DIVERSITY AND GENETIC RESOURCES

Like Noah's Ark, Protected Areas maintain a diversity of species for future generations. It is thought that a high proportion of over 18,000 species identified by the National Country Study as occurring in Egypt are found within the Protected Areas. As this figure is doubtless an underestimate, it may be assumed that the Protected Areas are harboring species yet to be discovered, including some that may be new to science. Protected Areas protect habitats with high concentrations of species and habitats important for particular species such as those with restricted distribution. They are also refuges for rare and threatened species, and the last remaining habitats for some. Egypt's Protected Areas are therefore reservoirs of biodiversity that may have future uses and applications. As a network, the Protected Areas have global significance in the worldwide effort to recognize and safeguard biological dive rsity.

Box 8: Medicinal plants

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Some 419 plant species, or almost 40% of Egypt's total plant species, are found in the Sinai Peninsula, and nearly half the plants endemic to Sinai are found in St. Katherine Protectorate. The Bedouin in southern Sinai are reported to use over 170 plants to treat medical disorders from colds and indigestion to bites and stings. The value of these medicinal plants, and the indigenous people's knowledge of them, has been internationally recognized. Pursuant to the Egyptian National Biodiversity Strategy and Action Plan, in 2002 the EEAA, in collaboration with the UNDP's sustainable development program and using GEF operational guidelines, began to conserve globally significant medicinal plant species and their associated habitats in St. Katherine Protectorate. Collection of critically endangered medicinal plants has been suspended in selected areas and small-scale community based cultivation has been introduced along with processing and marketing to relieve the pressure on wild plants. Sustainable collection methods are being introduced and grazing areas are being managed, to relieve pressure on endangered species. The project also protects the local people's intellectual property rights regarding their knowledge and use of the plants. The project also conducts medicinla plant surveys and studies in other parts of Egypt.

NCS

PROTECTED AREAS PRESERVE SCENERY, LANDSCAPES AND GEOLOGICAL FORMATIONS

The Protected Areas preserve outstanding natural scenery and geological features formed over millions of years. Increased awareness of the value of these resources helps to promote research on them and wider interest in their conservation. Protected Areas are providing alternative and sustainable types of use of these areas, such as ecotourism. Millions of travelers around the world choose whether or not to visit a particular country based upon their assessment of how active the country is in protecting its natural habitats.

Box 9: Wadi El Hitan

NCS

An area of the Wadi El Rayan Protected Area called Wadi El Hitan, or Valley of the Whales, has been included in the UNESCO World Heritage List, after a two-year process leading to its nomination during 2004-2005. The Egyptian Italian Environmental Cooperation Program (EIECP) provides funding for the protection and development of Egypt's first natural World Heritage Site. Planning for ecotourism development and preparation of a business plan to establish the means of sustainable operation are among the project's present activities. Fossils of ancient whales from the earliest, now extinct, suborder of whales, the archaeocetes, are ancestors of the two modern suborders of cetaceans. The whale fossils, one species of which was up to 21 meters long and another species which had vestigial hind limb bones, are found in an area some 40 kms west of the Wadi El Rayan lakes. Over 400 fossils of whale skeletons and of those 19 other marine vertebrates have been identified so far.

Box 10: St. Katherine visitor center

M&D

The Visitor Center at St. Katherine Protectorate, situated close to the access road to the Monastery of St. Katherine, was built by local Bedouin using traditional building techniques and materials. The small cluster of six small buildings, which blend with the local landscape, are linked by open terraces which afford stunning views of the mountains and the Plain of Raha. The visitor takes a tour through time, viewing a series of 5 graphical presentations with "origins" as the thematic link i.e. Origins of Sinai, Origins of Man in Sinai, Origins of Sinai's Nature, Origins of St. Katherine's Monastery, and Origins of the Protectorate. The concepts developed in this visitor center, its design and use of materials, are intended to serve as models for visitor centers in other Protected Areas.

PROTECTED AREAS ARE RESOURCES FOR EDUCATION, TRAINING AND SCIENTIFIC RESEARCH

Interpretive programs for visitors from Egypt and abroad are encouraging appreciation of nature and generating support for conservation efforts. Protected Areas offer many opportunities for training, helping to build needed national capacities for protected area management and promoting international cooperation through the exchange of information and experience.

The academic community in Egypt has been active throughout the development of the Protected Area Network. Several universities have established field research stations, such as the New Valley University in Aswan which conducts research activities in the Wadi Allaqi Protected Area. The Suez Canal University has a marine Research Center in Sharm El Sheikh and another field centre in St. Katherine Protectorate which it uses to conduct various research projects in the South Sinai Protectorates.

Box 11: Fustat eco-camp

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"Fustat" is the first privately owned eco-facility to be located within the Wadi El Gemal National Park. Situated about five kilometers into the main watershed of Wadi El Gemal, Fustat's tents and other facilities blend into the relatively untouched Eastern Desert landscape and the facility is managed on the basis of sustainable tourism principles. It offers an alternative model to the large resorts for tourism development in the southern Red Sea. The staff are recruited locally from a number of local tribal communities, for whom receiving foreign visitors is as much a new experience as is dealing with each other's native languages. Wildlife viewing and camel trips deep into the desert mountains, along with the coastal attractions of the Park afford an authentic natural experience.

PROTECTED AREAS ARE A PRINCIPAL RESOURCE FOR RECREATION AND NATURE-BASED TOURISM

In 2001 there were over one million visitors to Protected Areas in Egypt. And tourism has become one of the primary uses of the Protected Areas. Diving and snorkeling brings an estimated 1.4 million visitors to Egypt's Red Sea coasts every year. Desert trips by car and camel are becoming more and more popular with foreign and Egyptian travelers. Ornithologists and recreational "birders" consider Egypt a highly important area for viewing and studying resident and migratory birds. As a consequence Protected Areas generate revenue and jobs in the public sector, private sector, and local communities.

As most of Egypt's population lives in densely populated cities and towns where there is little open or green space, the Protected Areas are becoming important locations for domestic tourism. Tens of thousands of Egyptian and foreign residents of Egypt are finding that Protected Areas are places where they can enjoy nature, outdoor activities, and escape the stress, noise, crowds and pollution of urban life. It is reported that approximately 15,000 people visited Wadi El Rayan Protected Area during the national spring holiday.

ECOTOURISM

IUCN defines ecotourism as "environmentally responsible travel and visitation to relatively undisturbed natural areas, in order to enjoy, study and appreciate nature (and any accompanying cultural features of both the past and present), that promotes conservation, has low visitor impact and provides for beneficially active socioeconomic involvement of local populations."

The International Ecotourism Society defines ecotourism as responsible travel to natural areas that conserves the environment and improves the well being of local people. This means that those who implement and participate in ecotourism activities should follow these principles:

* Minimize impact;
* Build environmental and cultural awareness and respect;
* Provide positive experiences for both visitors and hosts;
* Provide direct financial benefits for conservation;
* Raise sensitivity to host countries' environmental and social climate;
* Support international human rights and labor agreements.

The Ministry of Tourism's website notes: "For certainly over 150 years, people have been visiting Egypt to bird watch, and with Egypt's expanding national park system, it is likely that this activity will become even more popular."

Box 12: Al Karm ecolodge

Recognizing that national objectives of expanding tourism in the Sinai Peninsula should be balanced by developing environmentally and culturally sensitive tourist facilities in Sinai's wilderness areas, and committed to engaging local people in the management and conservation of their environment, the St. Katherine Protectorate encouraged the development of the Al Karm Ecolodge. With the financial support of the EU, local artisans adapted some abandoned stone buildings, that were situated close to the ancient pilgrimage route to the Monastery of St. Katherine, into a highly popular ecolodge. Five guest rooms accommodate up to 16 people. The dining room and sanitary facilities combine traditional Bedouin architecture and modern water-saving devices. Solar heated shower units and composting toilets are modern solutions to the age-old problems of water conservation in an arid environment. Meals prepared for guests and hiking trips led by the Bedouin offer tourists an environmentally and culturally valid experience.

Wadi Isla (St. Katherine) NCS

A National Strategy and Action Plan for Ecotourism in Egypt submitted to the Ministers of Environment and Tourism in June 2005, offers a work program for formulating national policies and strategies for development of ecotourism in Egypt that takes into account all the various stakeholders.

PROTECTED AREAS PROTECT CULTURAL HERITAGE SITES

Egypt is rich in cultural heritage from ancient and recent times. Given the number of such sites in Egypt, and the remoteness of many of them, protecting them from vandalism and theft is challenging. Those that are located in the Protected Area Network are included in the management plans of the protectorate, in order to promote their restoration, protection and sustainable use as tourist attractions.

For instance there are a number of culturally important sites within the St. Katherine Protectorate, apart from the world famous 4th century Monastery which is the centre of the St. Katherine Area Cultural World Heritage Site.

use of natural resources and a vicious circle of resource abuse and further poverty. The Protected Area projects and management plans involve these people in their activities, in order to benefit from their knowledge, gain their cooperation, and provide them with new income opportunities.

The local community partnered activities developed over the last ten years in St. Katherine Protectorate have provided a remarkable amount

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GM

of experience in local outreach and provide Protected Area management with ideas, lessons and models for the development of similar partnerships in and around other Protected Areas.

PROTECTED AREAS PRESERVE INDIGENOUS KNOWLEDGE AND CULTURE

Protected Areas help communities living in or near them to maintain their traditional lifestyles, while offering them a means to improve their standards of living. There are many traditional communities in Egypt, many of them living in quite remote locations. They tend to be among the poorest and most marginalized people in the nation.

These communities, however, have rich and colorful cultures and are an important component of Egypt's cultural landscape. Relying on natural resources for their way of life, they have extensive knowledge about the habitats, species and land-forms found in their environment. Modernization and development are bringing changes, causing these communities to lose their traditional knowledge and practices, which leads inexorably to unsustainable

BEDOUIN SUPPORT PROGRAM

Some 7000 Bedouin live in or around the St. Katherine Protectorate, many in scattered remote settlements that are largely inaccessible to service providers. In 1996 at the beginning of the EEAA/EU South Sinai projects, a multidisciplinary research team was deployed to discuss with the Bedouin their perceptions and uses of natural resources and to involve them in management planning for the protected areas. A meeting of 125 representatives of the Bedouin communities resulted in the Bedouin Support Program as a mechanism to assist in community development. Primary health care was a high priority for all the Bedouin and the project

Box 13: Al-hilf

A conservation ethic is deeply rooted in the Bedouin tribal system of al-hilf ("the agreement") which controls seasonal uses of pasture or personal actions dakhl ("essence"), usually in connnection with the use and protection of trees. These systems are enforced by tribal law ('urf). When a person pledges to uphold a principle that all tribal people consider just, acting against it violates both a person's honor and 'urf itself. Though the traditional conservation systems are now largely a thing of the past, 'urf still operates, and several Bedouin still claim a traditional responsibility for wildlife protection in some areas.

Recently, a research project in the high mountains of the St. Katherine Protectorate discovered that the tiny endemic butterfly *Pseudophilotus sinaica* was critically endangered and restricted to an area of about four square kilometers. The caterpillars and adults feed only on Sinai thyme *Thymus decussatus* which is also a threatened endemic species. In an attempt to protect this butterfly, the local Bedouin, with the support of the Protectorate management, declared in 2002 the Farsh Shayeb near the summit of Gebel Safsafa a traditional hilf. It is only a few hundred square meters in area, but the hilf contains dense stands of thyme and domestic animals are kept out until the thyme has flowered and the caterpillars have hatched. This is the first newly established hilf in the living memory of the local Bedouin communities.

provided doctors, a 4WD clinic ambulance and training for local health workers. The Protectorate hired and trained 30 Bedouin, selected by their own communities, as Community Guards, while others have been employed as drivers, office workers and artisans. Local people constitute 70% of the Protectorate's staff. FanSina (Sinai Arts), involving over 300 women, has become a privately owned women's handcraft business.

PROTECTED AREAS PROMOTE SUSTAINABLE DEVELOPMENT

At the World Sustainable Development Conference in Johannesburg, South Africa in 2002, Egypt joined other countries in their commitment to sustainable development. The Protected Areas contribute to this facet of national

development through protecting natural resources while promoting their environmentally sound and sustainable use. By controlling human activities such as inappropriate development, pollution, desertification and unregulated hunting, Protected Areas are helping to prevent or to reduce environmental degradation. While some activities must be prohibited in order to maintain the resource base, others are permitted and regulated, such as tourism, fishing, grazing and vegetation harvesting.

DEVELOPMENT PARTNERSHIPS

In addition to developing close working relationships with local communities in and near Protected Areas, the EEAA and NCS actively build partnerships with other government agencies, the public and private economic sector, non-governmental agencies, academic institutions and international institutions to gain support for Protected Area management activities. One particularly important partnership was the cooperation between three GOE parties the TDA, EEAA and the RSG which worked together from 2000 to 2004 to develop a sustainable development model for nature based tourism in the southern Red Sea. The cooperation saw fruition with the "Mersa Alam Declaration" in May 2004 when the Ministers of Tourism and Environment together with the Red Sea Governor issued a declaration that the Red Sea area south of Mersa Alam is designated as an exclusive ecotourism area.

Great importance is given also to establishing close relations with city councils, governorate and other local officials, and national governmental bodies. One of the private sector's largest group of stakeholders in conservation of protected areas is the tourism industry, and a number of partnerships have been developed arising from touristic use of protected area locations and resources.

The Director of NCS recently signed an agreement that twinned Wadi Rayan Protectorate with the Gran Sasso National Park in Italy.

Box 14: Abu Salama Society

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A unique coral reef south of Mersa Alam includes a lagoon in which Spinner Dolphins *Stenella longirostris* congregate in large numbers. The dolphins created a tourist boom in the area, but by 2003 the pressure was too great and the dolphins actually left, apparently disturbed by the number of motor boats and visitors. On the advice of the NCS, the Governor of the Red Sea issued a decree stopping all tourist activity at the reef until a management plan could be developed and put in practice. Scientific teams interviewed all stakeholders in the area and held workshops to discuss a zoning plan for the area, a restricted zone, defined times of use and numbers of visitors allowed, implementing a fee system, and monitoring program. The Abu Salama Society, an NGO formed amongst various stakeholders, has participated in the ongoing management of the area with support of the Italian Government. Their monitoring program has shown an increase in the number of dolphins using the site and new growth of coral reefs since implementation of the management. The revenues generated have reached $500,000 annually, shared between the NCS, the Red Sea Governorate and local NGO's. The Samadai Dolphin House is an ideal model for applying ecotourism policy to conserve biodiversity and generate sustainable financing for biodiversity conservation. The partnerships developed here have benefited all stakeholders and provide a model for similar future partnerships.

SUPPORT OF THE NATIONAL POLITICAL LEADERSHIP

Because Protected Areas are planning and conservation tools that have long term strategic visions and objectives, gaining the understanding and support of top political leadership in the country is very important. The EEAA and the Protected Area Network under NCS management have enjoyed considerable levels of support from political leaders and government at the national level, but the competition, and the threats to natural resources, are ongoing and serious.

At all levels of involvement and partnerships, there is a delicate balance to be struck among the various stakeholders. While it is important to consult with and involve key stakeholders, care must be given in solving conflicts of interest in order not to reduce the authority of the Protected Areas' management. Often, giving a stake to other parties may complicate and impede the effectiveness of NCS management in achieving what they have determined are proper objectives. The NCS is actively engaged in efforts to involve all stakeholders in the Protected Area Network's management, while being careful to fulfill its mandate of safe-guarding and conserving Egypt's natural heritage.

THE FUTURE

The establishment of a modern, representative system of protected areas in Egypt has a relatively short history, beginning with the declaration of Ras Muhammad National Park in 1983. This report is intended to gives an idea of the significant areas of progress made in just twenty-three years. It is a record of the efforts of the Nature Conservation Sector to put into practice the ideas and vision of both the Egyptian and the international conservation communities. Some of the ideas and methods are well understood and have been tested and refined here and in other countries, while others have come from various facets of Egyptian culture and are truly home-grown, such as the traditional practice of hilf.

Declaration of Protected Areas and measuring their size in square kilometers is one accomplishment. It is quite another effort to ensure that they are effective tools for nature conservation and to manage them so that they meet the aims for which they were created. Therefore, we have undertaken this evaluation exercise, which is a recent innovation in the international conservation field and one that Egypt has pioneered in the Middle East.

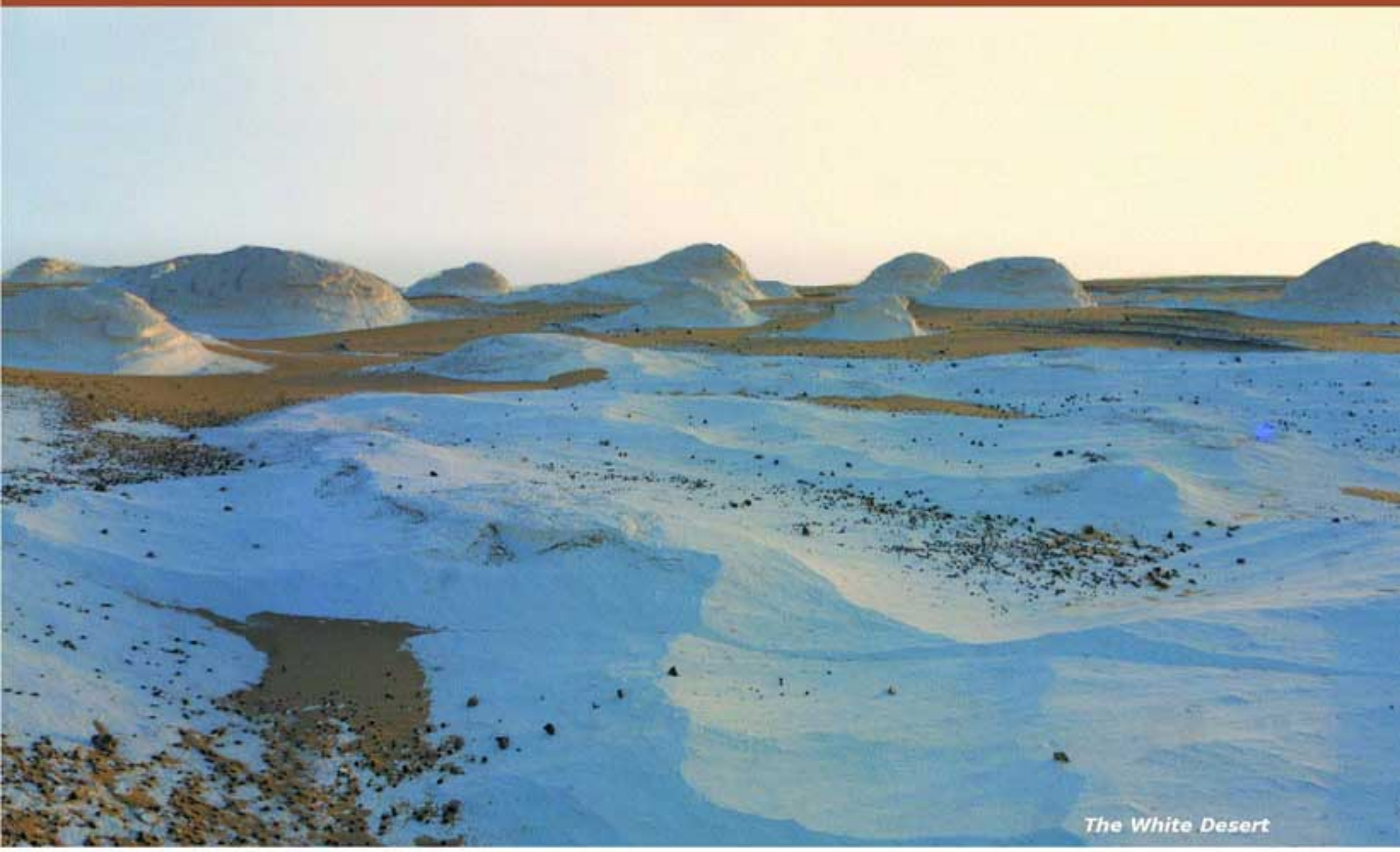
Through studying and examining the development and management of the Protected Area Network in Egypt, we have found many things that encourage us and give confidence to local conservationists, our employees and the public. We need to learn from these experiences, consolidate our knowledge and then extend those practices that are useful in order to strengthen management. At the same time, some of the lessons learned have been difficult and require dedication of additional resources and new types of efforts and innovations.

Our commitment is to conserve and manage these resources for Egypt, but many of them are also of global significance. Egypt can be proud of having two World Heritage sites, the World Cultural Heritage Site at St. Katherine Protectorate, and the natural World Heritage Site at Wadi El Hitan. We must build upon our experience to safeguard these and all of the Protected Areas.

Our hope is that the experiences presented in this report, the lessons learned, and the priorities for the future will be valuable to Egypt, our immediate neighbors and the wider world.

GAZETTEER

Egypt's Protected Areas



Since the passage of Law 102 in 1983, 24 Protected Areas have been declared in Egypt. The present Protected Area Network covers around 9.4% of the country's land area, and includes a representative range of habitats and physiographic regions along with sites of particular importance such as biodiversity hotspots, cultural heritage sites, geological formations and landscapes of outstanding natural beauty. The Protected Areas are of varying size, from the Elba Protected Area with 35,600 km^2 to the Salluga and Ghazal Protected Area with 0.5 km^2.

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This gazetteer of Egypt's protected areas describes the sites in the order in which they were declared.

Ras Muhammad National Park is Egypt's oldest and best known protected area. The headland, overlooking the juncture of the Gulfs of Suez and Aqaba at the southernmost tip of the Sinai Peninsula, is fringed by sheer cliffs of coral that descend 100 meters into the sea, affording some of the best diving sites in the world. Littoral habitats include a mangrove community, salt marshes and intertidal flats. The Park protects reefs to the east, as well as the islands of Tiran and Sanafir, breeding grounds for globally threatened seabirds and marine turtles. Adjoining sea grass beds are feeding sites for the rare Dugong. The Park also harbors a diversity of desert mountain and wadi habitats, gravel plains and sand dunes, and the area is an internationally important concentration point for migratory soaring birds. The majority of White Storks, some 250,000, breeding in Central and Eastern Europe pass through the Ras Muhammad National Park every year in late summer and autumn.

Zaranik Protected Area is on the Mediterranean coast of North Sinai and protects the lagoon at the eastern end of Lake Bardawil and the beaches to the east. Zaranik is an important bottleneck and staging area for hundreds of thousands of migrant palaearctic waterbirds in the autumn. Many birds, such as Greater Flamingo, overwinter while large numbers of terns and waders breed during the summer months. The area is one of the largest nesting sites of sea turtles on the Egyptian Mediterranean coast. Due to the absence of pollution, the lake produces some of the highest quality fish and salt in the country. The park's interior consists of undulating sand dunes interspersed with salt marshes and palm groves harboring several globally threatened species including the Egyptian Tortoise, Sand Cat and Fennec Fox. The Protected Area includes several archaeological sites and a traditional Bedouin community.

El Ahrash Reserve is a tiny area of coastal dunes in North Sinai near the border with Gaza that has good plant cover, much of it introduced species planted to stabilize the sand dunes. Several rare, endemic and restricted animals and plants occur in this protected area and benefit from its conservation status.

Elba Protected Area is a huge reserve at the southeastern corner of the Eastern Desert, comprising an enormous variety of habitats and landscape features. The most prominent component is Gebel Elba which, due to its proximity to the sea and its latitude, receives the edges of Indian Ocean monsoon weather. Its summit is

a "mist oasis," creating a unique and rare ecosystem supporting a biological diversity unparalleled in any other desert environment in Egypt. Many Afro-tropical elements have their northern limits at Gebel Elba. The mountain has exceptionally diverse flora, with some 458 species of plants, and the only natural woodland in Egypt. Globally threatened species, archaeological sites including rock drawings, and outstanding natural scenery are found in other desert mountains, plains and wadis of the Protected Area. The area also has important marine and coastal habitats, including extensive fringing coral reefs, islands, seagrass beds and the largest mangrove stands in Egypt.

Islands off the coast and south of Hurghada, as well as mangrove stands along the entire south Red Sea coast, were included in the Prime Ministerial Decree for Elba Protected Area, and are managed as a separate unit. The islands are internationally important breeding sites for seabirds, with over 30% of the world's population of the globally threatened White-eyed Gull breeding there, while endangered sea turtles also nest on islands. The northern islands are situated on major migration routes for soaring birds. Mangroves on the coast and islands are vital nurseries for Red Sea fisheries, and marine animals such as the rare Dugong and dolphins frequent the offshore waters.

El Omayed Protected Area encompasses a small segment of the Mediterranean coastal desert, a distinct habitat and one of the richest in terrestrial biodiversity in Egypt. It is the only protected area of this habitat type and includes biological components not found in other protectorates. The area has high floral diversity and good vegetation cover, as well as several endangered, endemic and restricted range animal species such as Pallid Gerbil, Four-toed Jerboa and the Egyptian Tortoise.

Saluga and Ghazal Protected Area, two small granitic islands in the Nile at Aswan, support a luxuriant natural vegetation cover including some of the only remnants of natural nilotic vegetation existing in the Nile

Valley before cultivation by man. The islands protectorate shelters a botanical diversity of some 94 species, but many characteristic Nile fauna are also present, particularly birds. The Protected Area plays an important role in preserving an exceptionally beautiful natural landscape of the Nile River at Aswan, which has long been one of the city's primary tourist attractions.

Ashtum El Gamil Protected Area is part of Lake Manzala, the largest and most productive of the Nile Delta wetlands. Formerly, the lake was one of the most important wetlands in Egypt and the Mediterranean for wintering waterbirds, and some 35 species are known to still breed here. Ashtum El Gamil protects gravid fish during passage to and from the Mediterranean from Manzala. Ruins of a Roman city are found on Tennis Island in the protected area.

St. Katherine Protectorate occupies much of the central part of South Sinai, a mountainous region of Precambrian igneous and metamorphic rock which includes Egypt's highest peaks. The Monastery of St. Katherine and Mount Sinai are only two of the area's outstanding cultural and religious heritage sites. The mountain setting is one of the country's biodiversity hotspots, supporting a diverse and unique assembly of flora. Some 419 plant species, representing almost 40% of Egypt's total flora, are found in this region, and nearly half of the 33 known plants endemic to Sinai are found there, many of them rare and endangered. The St. Katherine region is equally rich in fauna, with several species not found elsewhere in Egypt or the world. Bedouin communities living within the Protectorate pursue their traditional ways of life, and now participate in and benefit from the activities of Protected Area, as community guards, manufacturers of handicrafts, guides, and hosts for ecotourism activities.

El Hassana Dome Protected Area encloses a unique geologic formation on the outskirts of Cairo, where an Upper Cretaceous dome appears amidst the dominant Eocene plateau.

Lake Qarun Protected Area occupies the lowest part of the Fayum Depression, at 43m below sea level. The lake is slightly more saline than sea water, and is a wetland of international importance for wintering waterbirds. Dahab Island is an important breeding site for the Slender-billed Gull. The surrounding desert contains

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spectacular geologic formations, important fossil deposits, and cultural heritage sites that include Neolithic sites and Roman cities and temples.

Wadi El Rayan Protected Area is comprised of two man-made wetlands formed by the flooding of a desert depression. In winter the lakes teem with waterbirds, while the deserts of the Protectorate offer scenic landscape features including limestone escarpments, sand dunes, sand sheets, gravel flats and an excellent and rare example of an uninhabited Saharan oasis. Several threatened animal species are found in the deserts along with internationally known marine fossil deposits and archaeological sites from the Graeco-Roman period. Given its proximity to Cairo and other urban centers in the Nile Valley, Wadi El Rayan is becoming a popular destination for recreation, education and scientific research.

Maadi Petrified Forest Protected Area encompasses a segment of Egypt's Eastern Desert limestone plateau that contains the petrified remains of a 35 million year old forest. The area is one of the only remaining sites within the bounds of Greater Cairo where desert wilderness and some of its wildlife can still be seen.

Wadi El Allaqi Protected Area protects one of the most significant wadis in the southern Eastern Desert, including parts of the largest inlets on Lake Nasser. This vast desert region has diverse habitats ranging from the western flanks of the Red Sea mountains to an extensive network of wadis and hills approaching the shoreline of the lake. The newly established aquatic habitats in and around Lake Nasser are home to several species that have lost most of their habitats elsewhere in Egypt, such as Nile Crocodile, Nile Monitor Lizard, and Nile Shoft-shelled Turtle. The lake has become an increasingly important wintering ground for waterbirds and is situated on major flyways for migrating birds. The downstream poriton of Wadi El Allaqi supports desert plans and animal communities including the largest Dorcas Gazelle population remaining in Egypt. The area is also an important center for scientific research on desert plants and traditional natural resources uses by the local Ababda and Bisharin communities.

Sannur Cave Protected Area safeguards a cave, a rare geologic feature in Egypt, which is of interest for paleoclimatological records.

Abu Galum Protected Area includes a remote and pristine stretch of beach along the Gulf of Aqaba coast fringed by species rich coral reefs. The high basement complex coastal mountains are well represented in this area, containing faunal and floral components characteristic of the hinterland of South Sinai. Abu Galum has the most southerly distribution of a number of Mediterranean plants, and Nubian Ibex is a prominent mammal species. Fishing communities practice traditional artisanal fishing in coastal waters. This Protected Area plays an important role in regulating land use, acting as a buffer between tourist development and protecting natural resources in the area that forms the backbone of the region's economy.


Wadi Rayan NCS

Nabq Protected Area, lying along the Gulf of Aqaba Coast, is an area of outstanding natural beauty that features one of the northernmost mangrove communities in the world. Other representative Red Sea habitats include sea grass beds, coral reefs and tidal flats. The inland desert supports rich plant and animal life, including one of the largest populations of gazelles in southern Sinai. There is a small artisanal fishing community and Bedouin communities are participating in and benefiting from tourism to the area.

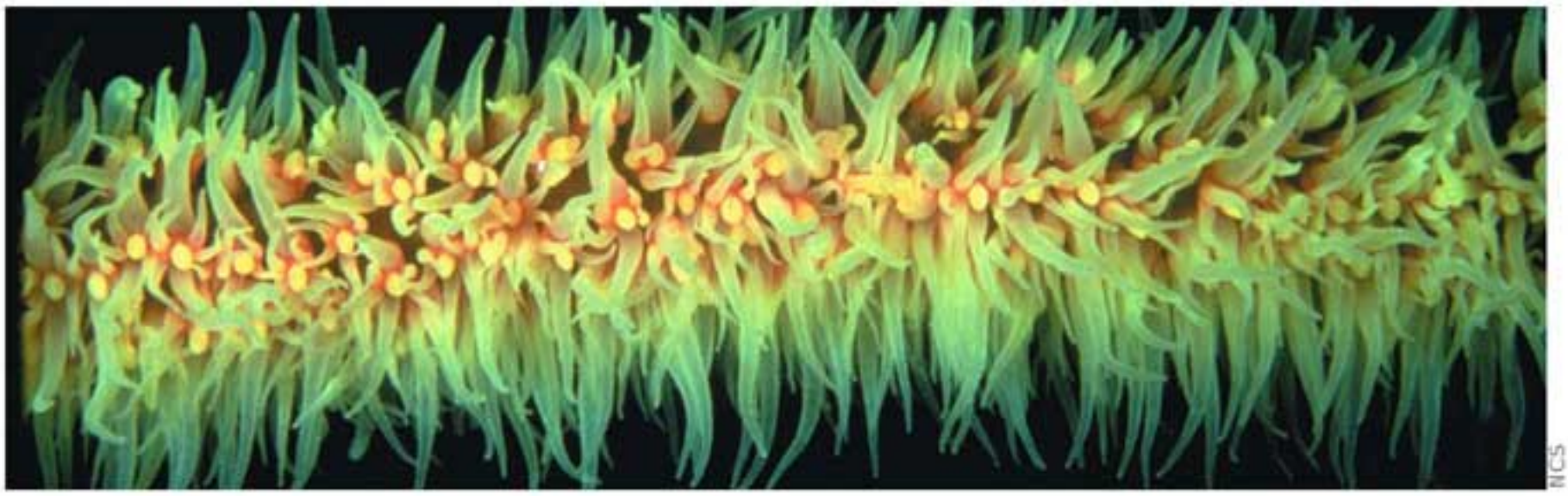
Wadi El Assiuti Protected Area is a small example of a desert wadi ecosystem in the limestone portion of the Western Desert. Much of the wadi is still in its natural state and undisturbed.

Taba Protected Area conserves the inland highlands of the northern Gulf of Aqaba. The area called the Colored Canyon, a 700m long narrow winding canyon of remarkably colored sandstones, is a major tourist attraction. Bedouin communities cultivate numerous oases in the protected area which are also sites of important examples of biodiversity and which have high esthetic value for tourism. The area has a wealth of cultural heritage sites dating from prehistoric to Islamic times, including rock drawings, Nabatean inscriptions and nawamis, the world's oldest roofed structures dating back 5000 years.

Lake Burullus Protected Area plays a primary role in preserving one of Egypt's most important wetlands. The large lagoon on the Nile Delta Mediterranean coast has fresh water swamps, reed beds, salt marshes and mudflats. Sand dunes rich in flora dominate the sand bar separating the lake from the sea. Exchange between the brackish lake and marine waters provides an ecotonal zone where many marine and aquatic organisms proliferate. Lake Burulllus is by far the least disturbed and polluted of the Delta wetlands and its environs still retain some aspects of wilderness which have been lost throughout most of the Delta. The lake is internationally important as a wintering and breeding site for waterbirds, and its fisheries are among the country's most productive.

Nile River Islands Protected Area consists of some 144 islands scattered along the Nile River in Egypt. These islands are important enclaves of biodiversity and wilderness even though situated near some of the most heavily populated areas of the world. Many of the islands are partly cultivated, grazed and even inhabited, but on most of them good natural habitats remain. A dense fringe of swamp vegetation, mainly reed beds, surrounds most of the islands and abundant bird, amphibian, fish and invertebrate life can be found. The islands and associated habitats of the River Nile represent one of the most important wintering grounds for waterbirds in Egypt today.

Wadi Digla Protected Area covers a large and steeply sided wadi stretching 30 km from east to west, cutting through Eocene limestone hills of the northern Eastern Desert. A fair amount of vegetation cover in the wadi bed is composed of a variety of perennial and annual species, and bats inhabit caves in the surrounding hillsides. The Protected Area is an important recreation and birding area for Cairo residents and offers excellent opportunities for educational programs, as well as sites for university level field research.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Siwa Protected Area extends from the Libyan border in the west to the western flanks of the Qattara Depression in the east, and from the Diffa Plateau in the north to the Great Sand Sea in the south. Siwa and its vicinity represent one of Egypt's most distinct regions geomorphologically, biogeographically and ethnically. The Siwa region supports several localized, rare, endangered and endemic species and their habitats, including Slender-horned Gazelle, Dorcas Gazelle, Fennec Fox, and is possibly still home to the North African Cheetah. The region is rich in cultural heritage and the local inhabitants have a colorful traditional culture forming an integral part of the region's landscape that is attracting growing tourist interest.

The White Desert Protected Area is located in one of the most attractive and astonishing landscapes of Egypt. Limestone erosional features create a spectacular landscape that has made the region world famous. Relict oasis habitats represent some of the largest extents of remaining natural vegetation in the Western Desert. The region incudes assemblages of fauna and flora characteristic of the Saharan biome, including several rare and highly endangered biological components. Cultural heritage sites date from prehistoric times to the recent past.

Wadi El Gamal National Park represents an integrated land and sea ecosystem containing a wide variety of habitats. The coral reefs that fringe the coast are among the best and most diverse in the Egyptian Red Sea and the area includes a significant proportion of the mangrove resources of Egypt. Substantial sea grass beds provide food for the threatened Green Turtle and the Dugong, while the coastal islands are important breeding sites for sea turtles and sea birds. Wadi El Gemal island hosts the world's largest known nesting colony of sooty falcons. The interior of the Protected Area is a complex and pristine mountain and wadi wilderness inhabited by a diversity of wildlife including several endangered species. The Wadi El Gemal watershed, over 1400 km2, is one of the largest drainage basins and probably the best vegetated wadi in the Eastern Desert. The area is inhabited by a pastoral people, the Ababda, who maintain their traditional lifestyle. The area has many archaeological sites including ancient trade routes, Roman gold and emerald mines and tombs of Muslim holy men. ■

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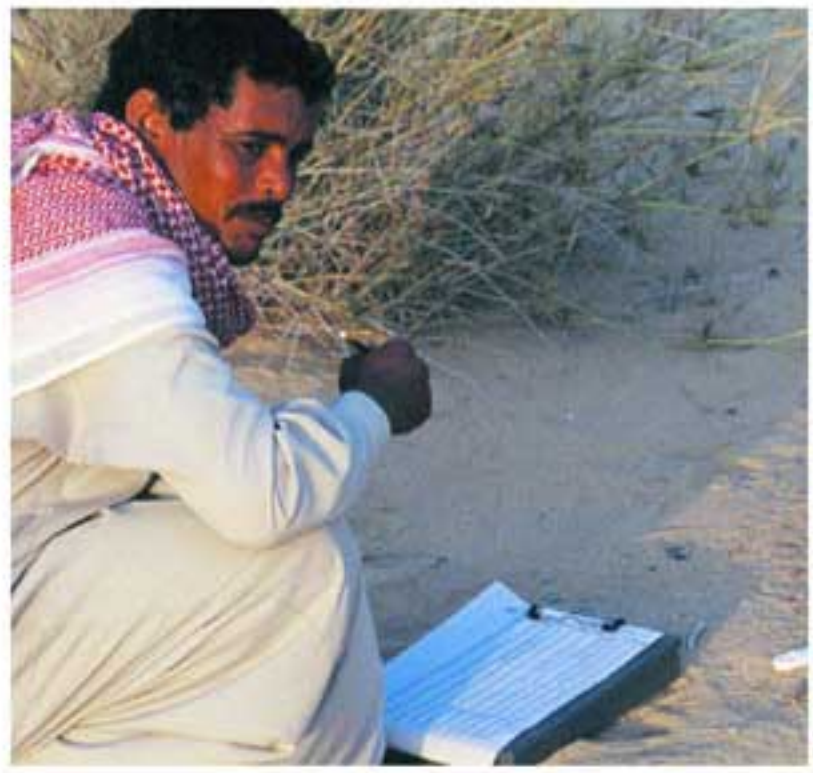

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