PROTECTION, CONSERVATION, AND MANAGEMENT OF THREATENED AND ENDANGERED SPECIES IN EGYPT

REPORT OF THE U.S. FISH AND WILDLIFE SERVICE -
NATIONAL PARK SERVICE STUDY MISSION July 30, 1977

PROTECTION, CONSERVATION, AND MANAGEMENT OF ENDANGERED AND THREATENED SPECIES IN EGYPT

Report of the U.S. Fish and Wildlife Service -- National Park Service Study Mission

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July 30, 1977

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SECTION I

INTRODUCTION

In 450 B.C., when writing about animal life found in the Nile Valley, Herodotus of Halicarnassus called Egypt the "gift of the Nile." Succeeding generations have maintained a facination with things ancient and Egyptian. For the ancients themselves there were similar facinations -- of unique interest is the relationship which the ancients defined between themselves and the wildlife which shared the Nile Valley. By 59 B.C. Diodorus Siculus had studied this relationship, pointing out that at least fourteen of the ancients' gods were represented by animal forms and that these animal gods, as well as the wildlife present at the time, were repeatedly shown in ancient hierogylphics. Today, for various reasons, most of these animals are extirpated within Egypt, and there are no parks, reserves, or refuges wherein the remaining wildlife of Egypt is completely protected.

Being aware of the strong interenational reputation of the Egyptian scientific community, and believing that there was still time to reverse the trend toward species losses in Egypt, the U.S. Fish and Wildlife Service sought and obtained Congressional authorization to develop excess foreign currency funded projects in Egypt aimed toward the preservation of threatened and endangered species. (The National Park Service has since requested similar funding to assist in directly related programs of habitat protection through management of protected areas.)

Such authorization was obtained under authorities contained in Section 8 of the Endangered Species Act of 1973 (P.L. 93-205). This Act provides for the use of foreign currencies accruing to the United States for funding cooperative development and management of programs with foreign countries when such programs are determined to be necessary or useful for the conservation of threatened or endangered species.

A joint U.S. Fish and Wildlife Service (FWS)/National Park Service (NPS) study mission traveled to Egypt from April 17 - April 29, 1977, with the objectives of (1) gathering data on the status of Egyptian wild flora and fauna and the natural areas where they are found, and (2) developing project ideas or recommendations deemed necessary or useful for the protection of threatened and endangered species. The study mission was composed of the following persons:

Mr. Lawrence N. Mason - Deputy Chief, International Affairs Staff, (FWS).

Dr. Robert T. Lackey - Associate Professor of Fish and Wildlife, Virginia Polytechnic Institute and State University (as Special Assistant to Associate Director, Environment and Research, FWS).

Dr. William Y. Brown - Consultant on Endangered Species to Associate Director, Federal Assistance, (FWS) and Executive Secretary to the U.S. Endangered Species Scientific Authority.

Mr. Kyran D. Thelen - International Park Specialist, Division of International Park Affairs, (NPS).

Detailed recommendations developed by the study mission appear as Appendix I to this report, a summary follows in Section II.

Egyptian hosts for the study mission were of the highest professional caliber, and the program which they arranged was well planned and apparently exhaustive in its coverage of Egyptian expertise. The study mission encountered genuine Egyptian interest in endangered species conservation and it was possible for both sides to pursue discussions of both a general and finite nature in areas of mutual interest. A listing of the contacts made by the study mission appears as Appendix II to this report.

Owing to the unique expertise of the International Union for the Conservation of Nature and Natural Resources (IUCN) and of the World Wildlife Fund (WWF), the study mission visited the international headquarters of both organizations in Morges, Switzerland, on its way to Egypt. This visit proved worthwhile in identifying Egyptian experts who were later contacted, finding out about other conservation work carried out in Egypt, and in securing IUCN and WWF assurances of future guidance and assistance in the Egyptian wildlife program.

The following report is submitted by the study mission and covers their visit of April 17-29, 1977. Further information on this program may be obtained from the International Affairs Staff, U.S. Fish and Wildlife Service Department of the Interior, Washington, D.C. 20240 (telephone/202-343-5188).

SECTION II

SUMMARY OF FINDINGS

The status of endangered and threatened species in Egypt appeared serious to the study mission. Information gathered from persons who have conducted field work in Egypt indicates that much of Egypt's fauna is biologically threatened or endangered. The faculty of Cairo University's Department of Botany was of the opinion that much of Egypt's flora shared this status.

No natural areas have been set aside in Egypt for the protection of plants or animals and the legal and institutional base for conserving wildlife is just now in the formative stage.

Scientific data which could be used as a basis for developing a wildlife conservation and management program in Egypt does exist. This data, however, is scattered among institutions and scientists. An overview can be developed rather quickly.

Wildlife management is not taught in Egypt. Nor are there game guards, wardens, or conservation unit managers. The public ethic for wildlife conservation is not strong.

The study mission feels that the trend may be reversable. It recommends four specific actions:

1. Collate existing data on Egyptian wildlife. Augment this with field study and analysis of threatened and endangered species and their habitats. Complete this phase by identifying those habitat areas which warrent special management in order to conserve and protect threatened and endangered species.

2. Select a priority area(s) for preparation of a comprehensive management plan(s). Develop programs necessary and useful for protection of threatened or endangered species. Initiate the plan.

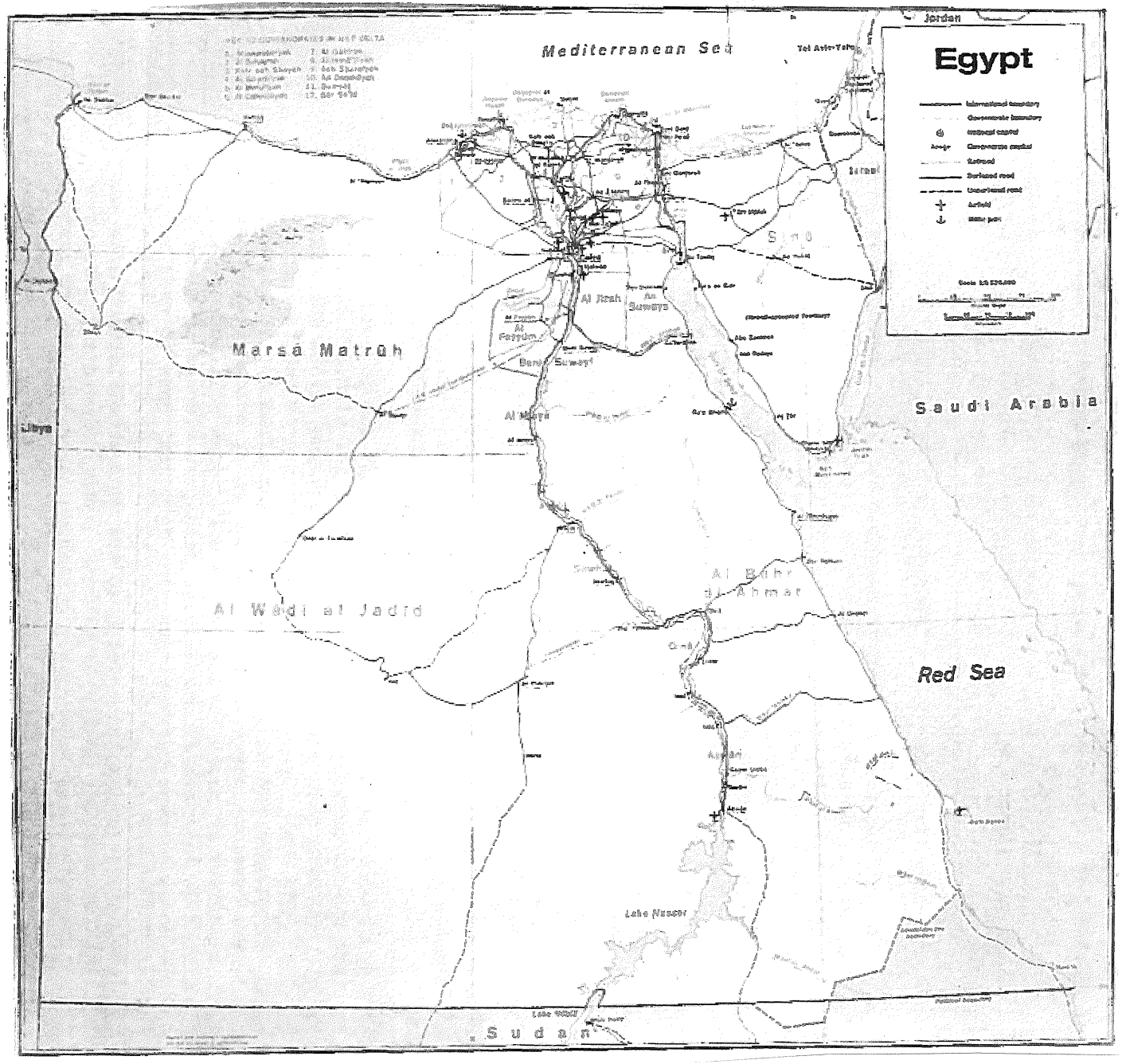
3. Develop multilevel training programs.

   a). University level: develop a wildlife management program for introduction into curriculum.

   b). Management level: develop a program to prepare conservation unit managers.

   c). Ground level: develop training programs for wardens and game guards.

4. Examine methods for raising public awareness and concern for the conservation of wildlife, particularly threatened and endangered species.


Egypt
Mediterranean Sea
Red Sea
Saudi Arabia
Libya
Sudan
Jordan
Marsa Matruh
Al Wadi al Jadid
Lake Nasser
Lake Nubia

SECTION III

PHYSICAL ENVIRONMENT OF EGYPT

The two dominant physical features of Egyptian terrain are the hot, dry desert that covers approximately 90 percent of the land area and the long, narrow, fertile Nile Valley with its large fan shaped delta. The river has provided livelihood, communications, and commerce to Egyptians for centuries. Because of rich fluvial deposits the river flood plain is one of the most intensely cultivated areas in the world with two and sometimes three crops raised annually in some places.

About 99 percent of Egypt's total population of 40 million live in the Valley. As the Nile Valley comprises only 4 percent of Egypt's total land area, this is a reflection both of the preeminence of the river in the people's existence and of the inability of the rest of the country, with the exception of a few oases and coastal areas, to sustain abundant human populations.

Hot, dry equatorial winds blow seasonally. These winds create violent sandstorms, providing an annoyance for people and animals and occasionally causing crop damage.

Since the time of the Pharoahs, men have attemped to control the excesses of the Nile and to exploit its great potential. In the past century modern engineering techniques have been used on projects designed to control and manage the Nile. With the completion of the Aswan High Dam and filling of the reservoir (Lake Nasser) behind it in the early 1970's Egypt achieved its goal of controlling water flow in the Nile. Water is available with small seasonable variation; irrigation is provided by machine rather than by hand (although most construction remains labor intensive); new lands are available for agriculture; some old lands are able to yield more than one crop per year; and electric power production has been tripled. Tending to offset these beneficial effects is the continued population growth that has kept pace

with increased agricultural production resulting from the High Dam project, siltation behind the Dam, and noticeable changes in wildlife populations and migration patterns. Egyptian experts believe, however, that populations of the Nile crocodile have begun to flourish in Lake Nasser to such an extent as to become troublesome to cottage industry fishing on the northern shores of the Lake.

Geographically, Egypt occupies about 386,000 square miles of the northeastern part of Africa. It is roughly rectangular, with the longest north-south distance being 674 miles, and a maximum east-west distance of 770 miles. The entire country lies within the wide band of desert that stretches from Africa's Atlantic coast through the broadest part of the continent and, with some interruptions, extending across Arabia into central Asia. The expansive desert areas bear many physical and climatic similarities to the desert regions of the southwestern United States.

The two major topographical divisions of the country are the Eastern Desert and the Western Desert. They are so named because of their relation to the Nile River, which runs north between the two through the entire extent of the country. The Western Desert is actually an extension of the Libyan Desert and covers over 240,000 square miles -- three times the size of the Eastern Desert. It begins at the edge of the Nile Valley and extends in a gradually rising plateau toward the west and southwest. In the extreme southwestern corner of the country there are mountainous outcroppings with elevations to 6,000 feet. Some geographers designate this general area as the Southern Desert, but the lines of division are really indistinct.

Western Egypt is one of the most arid regions of the world and includes great stretches of sand areas, with shifting dunes, uneven rocky outcrops, and large depressions. The dunes in some areas form long ridges of almost impassable sand accumulations that may lie in north-south parrallel lines for many miles; in other places the dunes have no pattern at all and form vast rolling plains. Several depressions in the area dip below sea level. Aside from these depressions there are no distinct drainage features.

Notwithstanding the harsh nature of the Western Desert, some wildife is present. Cheetah have been sighted within the last five years, and slender horned gazelle have been seen in small numbers at Siwa and other Western Desert oases.

The Eastern Desert, sometimes called the Arabian Desert, rises more abruptly from the Nile. The upward-sloping plateau of sand gives way within 50 to 85 miles to arid, defoiated, rocky hills running north and south between the Sudan border and the delta and reaching elevations of 6,000 to 7,000 feet. This elevated region has a natural drainage pattern but, because of insufficient rainfall, it rarely functions. It contains a complex of irregular, sharply cut wadis or dry stream beds. Their principal direction of flow is westward toward the Nile. Over the centuries these stream beds have cut through the cliffs on the edge of the eastern flood plain. Travel into this part of the country is frequently limited to the wadis because the other terrain is too rugged. There are no artesian flows in the Eastern Desert, and waterholes are formed by the accumulation of rare rainwater and occasional mountain springs.

Wildlife appears to be more plentiful in the Eastern Desert than in the Western. Here, slender horned gazelle, ibex, and occasionally barbary sheep are known to forage in the Acacia stands of far southeast Egypt in the Gebel Elba region. Ostrich are known to follow camel caravans out of the Sudan into Egypt through this same southeast region. African wild ass (probably partly feral) are also known here. Interestingly, holding troughs built by Roman legions at many of the rare springs found in southeast Egypt still provide the basic watering sources for wildlife.

Upland contours along the Red Sea coast serve to trap condensate and mist rising from the sea. This presence of moisture accounts for ground cover and the Acacia stands which nourish wildlife.

* * * *

The Sinai Peninsula is a triangular-shaped area of 23,600 square miles situated east of the Gulf of Suez and northeast of the Eastern Desert. Closely akin to the desert the southern sector of Sinai contains mountains that are a geological extension

of the Red Sea Hills. This is the low range along the Red Sea coast that includes the highest point in the country, Mount Katherina (8,600 feet), adjacent to Mount Sinai (also called Mount Musa). The southern side of the peninsula has a sharp escarpment that subsides after a narrow coastal shelf into the Red Sea and the Gulf of Aquaba. The tilt of the land from this area is downward to the north toward the coast of the Mediterranean. This sloping plateau begins at an elevation of over 3,000 feet and occupies about two-thirds of the peninsula ending in a flat, sandy coastal plain. This flat plain heads north with the eastern shore of the Mediterranean, and there are no natural barriers to the west toward the Suez Canal or to the northeast toward Israel and other countries of the Levant. Since the Sinai is occupied by Israel, Egyptian biologists are unsure of the current status of wildlife there, although the leopard is believed to occur.

* * * *

Some of the large depressions of the Western Desert have fresh ground water in sufficient quantities to support limited agriculture, wildlife, and permanent habitation. Siwa, close to the Libyan border, is such an oasis and has been supporting life since ancient times. Herodotus and Alexander the Great both visited its Temple of Amon. Other major oases include: Kharga, which is 140 miles west of Luxor; Dakhla, about 100 miles west of Kharga; Farafra, in the central part of the Western Desert, about 300 miles southwest of Cairo; and Bahariya, 210 miles southwest of Cairo.

The Qattara Depression, 50 miles from the Mediterranean coast and halfway between the Nile and the Libyan frontier, is the largest depression area. Its area is approximately 7,000 square miles, and its deepest point is almost 450 feet below sea level - the lowest elevation in the country. Since its water is salty, it cannot be classified as an oasis. Plans are presently being developed to determine the feasibility of utilizing the Depression as a reservoir for water channeled to the Qattara from the Mediterranean in a hydroelectric power

development scheme. About ten years after the channel opens, if calculations are correct, water level in the lake will have reached its optimum of approximately 200 feet below the Mediterranean. Thereafter, evaportation will theoretically equal inflow, permitting the power station to continue output at its installed capacity. The resulting lake would be equal in area to Lake Ontario.

The Faiyum Depression, about 40 miles southwest of Cairo, differs somewhat from the others. Its northern reaches, the deepest, lie in a shallow brackish lake called Birket Qarun, which is about 150 feet below sea level. By annual diversion of water from the Nile, however, sufficient food is produced in this area to support approximately one million people. The Faiyum is a major migratory bird feeding area. It is surrounded by large, tall stands of grass for feeding and some nesting. Ever present in this area are individuals prepared to rent shotguns to tourists for bird hunting.

* * * *

The Nile, almost 4,200 miles in length, is the longest river in the world, but only 1,000 miles of it flows within Egypt. The Nile enters Egypt near Wadi Halfa, a Sudanese town that was being rebuilt on high ground in 1969 after the original city had been submerged by Lake Nasser following construction of the Aswan High Dam. For almost 200 miles the channel is a narrow groove through cliffs of sandstone and granite. Below Aswan the cultivated flood plain strip widens to an average of 12 miles; below Isna (100 miles north of Aswan), the plateau on both sides of the valley rises as high as 1,800 feet above sea level. At Qena (60 miles north of Isna) 1,000-foot high limestone cliffs force the river to make a big bend and change its course to the southwest for about 40 miles before turning northwest for the next 100 miles to Assiut. From Assiut north the escarpments on both sides diminish, and the valley widens to 14 miles at one point. Finally, the Nile reaches the delta at Cairo.

The value of the Nile River in relation to the fertility and the productivity of the adjacent land, once largely attributable to the silt deposits laid by the flooding waters, is now achieved by extensive irrigation (including sub-surface catchments for salts) and fertilizers.

The delta region attracts vast numbers and varieties of resident and migratory birds. A recent study of bird migration in the delta was compiled by Dr. George Watson of the Smithsonian Institution.

* * * *

The Egyptian climate is characterized by a two-season year, long hours of blazing sunshine, and lack of rainfall. Climatically, the year falls into two parts: a cool winter from November to April and a hot summer from May to October. Spring and autumn, with their "bracing" period, as experienced in more temperate lands, are unknown. Practically no trees shed their leaves in winter and crops ripen in April and May as well as July and August. Except for variations in temperature, there is little difference between the two seasons.

Another characteristic of Egypt's climate is lack of rainfall. Most rain falls along the coast, but even there the average annual precipitation is only 8 inches. Inland, the amount falls off rapidly, until it averages just over 1 inch a year at Cairo. Between Cairo and the southern border, a direct distance of over 500 miles, average rainfall drops off to just a trace. Years with no rain may be followed by a heavy downpour resulting in flash floods and considerable damage.

The Sinai has a somewhat heavier rainfall than the other desert areas, averaging 5 inches annually in the north. As a result the region is dotted by numerous wells and oases, which support small centers of habitation and wildlife that historically were focal points on trade routes. Water drainage toward the Mediterranean from the main plateau supplies sufficient moisture to permit some agriculture in the coastal area, particularly near El Arish, 90 miles east of Port Said.

* * * *

The biogeography of Egypt can be modified from Osborn and Helmy's unpublished compendium, The Mammals of Egypt:

In the greater part of the Sinai Peninsula, Eastern Desert, and Western Desert, perennial vegetation is confined mainly in channels and catchments of the drainage systems. These are "run off" deserts in contrast with "rain deserts" which receive enough rainfall to maintain a continuous vegetative cover as in the Sinai Coastal Desert, Western Mediterranean Coastal Desert, and the Gebel Elba region.

Plateaus and mountain slopes are the most exposed to wind, sun, and evaporation and are the least vegetated. Exceptions are the higher peaks of Sinai and some mountain tops of the Red Sea Hills south of Gebel Gharib that are above 1,500 meters elevation and receive additional mountain originated rainfall. Wadi beds receive a lower wind velocity, collect and contain run off water, have more favorable substrata, and therefore possess the greatest concentrations of plant life. Likewise, the sand sheets and soils of depressions will support vegetation in otherwise barren country if they are sufficiently deep.

Desert vegetation has been classified into three basic subdivisions as associated with their water sources: accidental, ephemeral, and perennial. An occasional or accidental "rainstorm will bring up patches of vegetation from seed in the most unlikely parts of the ...desert" (Shaw, 1931). However, sporadic rainfall limits species diversity in both plants and animals and has produced shifting and tenuous populations in both (including man).

Ephemerals, although they may be germinated accidentally, are more abundant where annual rainfall is a certainty (e.g., Western Mediterranean Coastal Desert, northern part of the Eastern Desert and Sinai, and the Gebel Elba region.) Perennials are found wherever there is the meagerest amount of moisture, providing there are suitable soils in rock crevices, basins, or wadis where water can accumulate. Acacia trees are known to grow in catchment basins where there is only 1 mm. of effective rain every fifteen years.

* * * *

In general, areas with the deepest soil will have the largest number of perennials, regardless of the amount of precipitation. Shallow soils support ephemerals or accidentals only. Soils deep enough to have a permanently wet layer underlying a dessicated upper layer in the dry season form a suitable habitat for perennials. Climax vegetation in such situations is woody shrubs and trees. There are, however, exceptions to every rule. Soils, no matter how deep, if covered with a layer of desert armor or serir, especially if the stones are cemented together with capillary salts, are usually absolutely barren.

Due to striking taxonomic similarities of flora. the almost continuous deserts extending from the Sahara through the Middle East to Sind in Northwestern India became known as the North African-Indian Desert Province or the Saharo-Scindian Phytogeographic Region.

Most desert animals are indigenous to either North African or Southwest Asian deserts. Penetration east and west has been restricted either by the isthmus of Suez or the Nile Valley and delta.

NOTE: Major references for material in this section:

1. Mammals of Egypt, Osborn and Helmy, (unpublished).
2. Area Handbook for the Arab Republic of Egypt (DA PAM 550-43) 1970.

SECTION IV

STATUS OF NATURE PROTECTION AND WILDLIFE MANAGEMENT IN EGYPT

A. Conservation Laws

Egypt apparently has several laws for the protection of wildlife, including a law prohibiting the hunting of gazelle and certain other mammals. The taking of quail (Coturnix) is also regulated. Egyptian officials indicate that for all practical purposes these laws are not being effectively enforced.

B. Protected Areas

There are currently no protected wildlife areas (i.e., managed national parks, reserves, or refuges) in Egypt. One former reserve established for hunting purposes was disestablished several years ago.

Establishment of protected areas has recently received considerable attention from scientists as well as from government officials. This has been demonstrated by the formation of the Egyptian Society for the Protection of Nature and a Commission for the Protection of Nature within the Egyptian Academy of Science. Both groups are attempting to spur interest in wildlife and coordinate conservation activities in Egypt. There is, however, no government policy concerning protected areas nor is there an official or professional consensus as to the direction that such a system of protected areas should take.

Differences in philosophy range from the view, of some, that nature and endangered species, in particular, can best be protected through transfer and intensive management of species within controlled environments, to the more traditional management view of nature reserves where natural conditions and environments dominate. There are also discussions regarding the creation of wildlife exploitation areas, and genetical banks for a variety of species.

While each of these practices would have their place within a complete wildlife management system there is an emergent feeling that no one of these alternatives alone is sufficient to serve as a total conservation program for Egypt.

The Institute of Oceanography and Fisheries has expertise in marine resources and has taken initial steps toward study of potential marine parks and reserve areas. The Institute of African Research and Studies at the University of Cairo has carried out several ecological studies in Egypt and has one graduate student doing research on wildland areas.

Whether one looks at the governmental, university, or scientific community, Egypt seems to be clearly in the brink of action regarding establishment of protected natural areas. Open for advice, and anxious to take the correct action, a significant impact can occur by developing an international dialogue with Egyptian officials concerned with deciding these important issues.

C. Status of Endangered Species

Only a few species occurring in Egypt, mostly mammals, are listed under the Endangered Species Act of 1973. These species will be discussed below. However, many plants and animals not formally listed are no doubt endangered or threatened biologically and should eventually be added to the United States' list.

Leopard, Panthera pardus

May still occur in the Sinai, but otherwise extinct in Egypt. Known to have inhabited rocky mountains, cliffs and wadis of the Western Mediterranean Desert and the Qattara Depression.

Cheetah, Acinonyx jubatus

Found in the Northern Sinai peninsula, the Western Desert, and most recently the Qattara Depression. Frequents savannas and semi-desert areas.

Dugong, dugong dugong

Apparently still occurs off the Red Sea Coast. Officials of the National Academy of Science and Technology reported that about 15 were caught near Hurgada within the last three years. Otherwise, the last reported catch was 1965.

Slender horned gazelle, Gazella leptoceros

Still occurs in widely dispersed small numbers in the Western Desert, from Cairo southward. Frequents areas between dunes with scattered shrubs, stands of Acacia, and certain other vegetation surrounding oases.

African Wild Ass, Equus asinus

Occurs in southeastern Egypt, with the latest sighting in 1974. May be partly feral, but said to be primarily of original wild stock (Osborn, pers. comm.). Favor arid, remote wadis and plains with desert-like vegetation.

Nile Crocodile, Crocodylus niloticus

Several sources stated that crocodile are present in Lake Nasser and are common enough to provide an annoyance to Egyptian fishermen who claim that small individuals are damaging their nets.

D. Habitat Pressures

The following is a brief resume of problems often mentioned by Egyptians as being associated with protection of nature and wildlife management in Egypt. Each is, of course, complex and has not been collaborated as to its relative importance and is meant only to reflect current concerns of various individuals:

Fuel Production

The few remaining near-natural areas in Egypt with considerable vegetation, including acacia forests in the southern coastal mountains, are being rapidly destroyed by use of these trees in making charcoal both for export and local use. This condition has been brought about by an increased demand and a changing system of pastoral life. Continued decrease of vegetative cover will produce irreversible wildlife habitat conditions in key areas.

Industrial Expansion

Remaining waterfowl habitat is imperiled by industrial and housing expansion with consequent water pollution and vegetative destruction along the Mediterranean coast to the east and west of Alexandria. Reportedly, destruction of estuaries will have serious effects on coastal fish populations as well as various wildlife species.

Overgrazing

Many individuals in Egypt mentioned the problem of overgrazing by domestic livestock of the limited natural forage in desert ecosystems as a serious factor in destruction of wildlife habitat. Overgrazing is believed by some to be increasing and brought about by growing markets and more livestock, primarily sheep and camels. The competition between domestic and wild animals for forage is apparently threatening several species with extinction, and overgrazing itself is similarly threatening some plant species.

Hunting

Hunting pressures have increased in many sectors of Egypt. This has led to the near extermination of many wildlife species. Increased hunting pressures are said to be caused by the presence of military personnel who are killing animals in many of the military strategic areas of the country, both for sport and sustenance; by foreigners who came to Egypt in increasing numbers to hunt; and establishment of oil camps in previously uninhabited parts of the country. Some oil companies are said to prohibit employees from hunting.

E. Conservation Attitudes

There is, according to most Egyptian sources, an increasing awareness among government officials of the need for programs dealing with ecological and conservation matters. This has been accentuated by ecological problems associated with the Aswan High Dam, and is clearly reflected by Egyptian plans to hold a major international workshop on the management of wildlife in arid ecosystems, in Cairo, in early 1978.

There are many divergent professional views within Egypt concerning the best approach to be taken in nature conservation. Among some of the conservationists and government officials there is a strong feeling that conservation must be linked to economic and social development. Many comments regarding the need for linking parks and reserves to tourism development were expressed and several sites which could combine these objectives with wildlife conservation activities were mentioned as possible national parks and reserves. Game farming was also advanced as a possible source of income that could be associated with wildlife management.

The need to conserve genetic resources for possible future utilization in agricultural production was cited as an additional approach to conservation and included both faunal and floral considerations. Conservation of wild wheat and wild oats which grow in marginal desert areas provided the basis for this approach.

A strong opinion was expressed that the most appropriate method of wildlife management in Egypt is through establishment of intensively managed areas in which the wild species will be provided protection, cared for, bred, and ultimately sold to zoos.

There appears to be an underlying feeling that it may not be possible to manage and protect areas under natural conditions, even though it has never been attempted.

F. Expertise and Training

Personnel

Professional and technical responsibility for nature protection is assigned to the Giza Zoological Gardens in the Ministry of Agriculture. Since the programs and duties of the Giza Zoo have not included management of wildlife habitat or parks and protected areas there are very few individuals with training or experience in these fields. Training of the limited number of professionals at the zoo has generally been in veterinary medicine and nutrition.

Nevertheless, a limited number of individuals within Egypt have a clear idea of current international views regarding the protection of natural areas and habitat.

In addition, only a few of the professionals in conservation related fields within Egypt have had much field experience, particularly in the more remote areas of the country. For a number of reasons many areas have apparently not been visited by professionals for several years. The advent of military stability in the area may increase the possibility of renewed field work, especially by student researchers.

Conservation Education

Many individuals expressed the need for wildlife conservation education in Egypt at the professional student level, and the general public level. An intensive United Nations school environmental education program with accompanying materials has been prepared and will probably be used.

There is, however, very little information available to the general public concerning wildlife conservation. There is general feeling that the people of Egypt hold a relatively antagonistic and uninformed attitude toward the desert and consequently have no overriding concern to protect its natural ecosystems or even to visit them. An often heard comment is that "there's nothing there."

Although there is a growing concern among various groups of academicians, government employees, and some private individuals for the protection of nature, there is general agreement that there is no strong public support, interest, or understanding of most conservation objectives. Public support is considered essential to any successful and lasting program of protecting endangered wildlife in natural areas and was a clear concern at the highest levels of the Egyptian government.

University Training

Egyptian universities have a number of internationally respected scientists serving on their science faculties, particularly in the areas of biology, zoology, and botany. While these faculty staffs have emminent knowledge and experience in research concerning natural phenomena they are limited in wildlife or natural area management experience. There is a growing interest and strong desire among academics to include these subject matters in their curriculums. Currently, one course is taught in natural resources and wildlife management at the university level.

The University of Cairo is involved in nature conservation through its faculties of Science and its College of Veterinary Medicine. The Faculty of Science, through its Departments of Botany, Zoology and Entymology, which are highly respected not only through the Mid-East countries, but throughout the world, is presently carrying on much of the training and research and is considered a primary source of scientific information in Egypt in these subject areas. Although to date they have not had a concentrated interest in wildland or wildlfie management, any efforts in these fields would very obviously require a strong involvement from this faculty.

The College of Veterinary Medicine at the University of Cairo has graduated many of the trained personnel who work at the Giza Zoological Gardens and has indicated an interest in becoming more involved in wildlife matters. Although the present curriculum does not contain wildlife management courses, the Dean of the Faculty is seeking the proper means for introducing such courses.

Assiut University, through its Department of Plant Protection, and the University of Alexandria have also conducted research and studies on many botanical and zoological aspects of Egypt.

The University of Aim Shams is involved in a joint program with the Ecology Center, College of Natural Resources, Utah State University, in the study of the Desert Biome. The program is supported by P.L. 83-480 funds and is part of the International Biological Program. Various reports have been published on selected study sites.

In addition to universities and nature conservation groups there are a number of Academic Institutions and Scientific Institutes which play an important role in matters related to nature conservation. These include the Institute of African Research and Studies at the University of Cairo which carries on a number of research projects concerned with ecological matters of the desert and Red Sea coastal areas, and the Egyptian National Academy of Science.

G. Status of Information

There have been many research studies regarding highly specialized areas of zoology and several valuable ecological studies of specific regions of the country, particularly in the eastern desert and along the Red Sea. However, there have been few systematic attempts to identify areas which would be necessary for an overall protected area scheme in Egypt.

The plants of Egypt have been described systematically by V. Täckholm (University of Cairo, Department of Botany) in her four volumes of the Flora of Egypt. In addition, many excellent studies of plant ecology have been published by Dr. M. Kassas, also of the Department of Botany, University of Cairo.

The vertebrates of Egypt have been described in several excellent but dated works, for example, John Anderson's Mammals of Egypt (1902) and Reptiles and Bachtral (1898), as well as Meinertzhagen's Nicoll's Birds of Egypt (1930). In addition, information on the birds of Egypt has recently been compiled by George Watson of the Smithsonian Institution in Washington, D.C., and Dale Osborn (Field Museum, Chicago) and Ibrahim Helmy are soon to publish a new Mammals of Egypt.

A report entitled "Preliminary Review of the Wetlands of International Importance in the Mediterranean Region" was prepared by the IUCN. This report identifies potential areas for wetlands protection and the role of natural reserves. "Support of Bird Migration Across the Mediterranean Basin" by Michall Smart identifies important bird migration areas including Egypt.

The U.S. Naval Medical Research Unit No. 3, which is located in Cairo, holds detailed field records of wildlife obtained during many field trips in Egypt.

In addition, numerous other works on wildlife, geology, and the geography of Egypt are present in the University Libraries of Egypt. One particularly complete library is that of the Botany Department of Cairo University, compiled over many years by Dr. Vivi Täckholm.

SECTION V

INSTITUTIONAL STATUS OF WILDLIFE MANAGEMENT AND NATURE PROTECTION IN EGYPT

A. Ministry of Agriculture

Governmental responsibility for nature protection in Egypt is assigned to the Ministry of Agriculture. Within the Ministry, the National Zoological Garden at Giza which organizationally reports to the Sub-Secretary of Agriculture for Animal Health has been charged with carrying out programs in this field.

Other than the operation of the Zoo, which fulfills an important cultural, recreational and educational role, there are apparently no signficiant ongoing nature protection programs being carried out with the exception of a small program of migratory bird banding.

Although the Ministry has responsibility for enforcement of hunting and game laws and while there is a hunting licensing program, there appears to be little enforcement activity in this area. Some sources reported very few licenses were actually sold and that enforcement of regulations was not accomplished on a regular or effective basis.

In the past, the Zoological Garden has attempted to promote establishment of protected areas but has not received sufficient policy or budgetary support necessary to accomplish this goal. Such was the case in a recent attempt to establish a protected area near Lake Nasser.

Since there is no agency that has singular responsibility for wildlife management and nature protection, this responsibility is an adjunct to the more predominant objective of managing a large and successful zoo. In addition, there apparently has been no strong governmental impetus or policy for accomplishing the wildlife and protected area mission.

As opposed to many other countries which have agencies established for management of renewable natural resources such as forestry, range, wildlife, fisheries, or parks, Egypt has no such institutional arrangement, and this has clearly contributed to the lack of positive action.

The present institutional arrangement runs the risk of creating an identity problem with officials who may have a tendency to look upon wildlife management as paralleling the management of a large zoo. This is not the case with current top management personnel at the Giza Zoo, but it does appear to be true that some individuals and policy makers who have not had sufficient time to study the complexities and philosophy of wildlife or wildland management do exhibit this tendency.

B. The Egyptian Association for the Conservation of Natural Resources

This society is a private non-governmental conservation group composed of professionals from fields related to nature conservation as well as concerned private individuals. The society is affiliated with the IUCN. It is a recently formed organization and is now in the process of establishing an action program.

Their intention is to operate as a pressure group outside the government to influence governmental policy and public opinion toward conservation.

C. National Academy of Science

The Academy is the principal arm of the Egyptian Government concerned with coodination and execution of scientific programs. A number of programs of the Academy deal directly or indirectly with subject matter related to the natural environment.

D. The National Board for the Protection of Nature

The Board is affiliated with the Academy of Science and serves in an advisory capacity to that organization. Many of its members are influential government officials associated with environmental matters. Some of the same individuals are affiliated with the Society. The Board serves as a technical advisor to the Academy for programs and research concerning conservation and environment carried out by the Academy or institutes affiliated with the Academy. Because of the stature of its membership, this group will undoubtedly play a key role in policy formation concerning nature protection within Egypt.

APPENDIX I

RECOMMENDATIONS OF THE STUDY MISSION

During the past 30 years, a number of studies have been conducted dealing directly or indirectly with wildlife and wildlife habitat in Egypt. In large part, these studies have been classical in nature focusing on specific botanical or zoolical species. Studies dealing with the broader aspects of wildlife management, habitat or ecosystem composition and preservation are essentially incidental observations made during studies of other matters (for example, the excellent studies related to tick-borne diseases performed by the Naval Medical Research Unit #3).

To date, however, there has been no overall study in which analysis of existing information on endangered wildlife and the environments upon which they depend for their survival have been treated.

As a result, those Egyptians who are indeed aware that their country is in grave danger of loosing many of its native species of flora and fauna do not have the proper data base upon which to plan and execute conservation programs.

Given this situation, the first recommendation of the Study Mission is to collate existing data into a single source, and to augment this with study and analysis of endangered and threatened species and supportive habitat. The objective of such an exercise will be to identify those habitat areas which warrant special management in order to conserve and protect the threatened and endangered species and their supportive ecosystems in Egypt. Such a plan would carefully consider the various economic development, social and conservation objectives of the country and include recommendations for a system of managed conservation and protected areas.

Secondly, the Study Mission recommends that once such a study is completed, that the section of a priority area(s) for preparation of a comprehensive management plan(s) which would specifically include programs necessary and useful for protecting threatened and endangered species be made. Following the planning stage and the creation of Egypt's first conservation unit for the protection of threatened and endangered species, the recommendation is that a management program for the pilot area(s) be initiated. Such a program could include natural resources management, visitor programs, infrastructure and facility development, personnel training, and research. The Study Mission further recommends a series of workshops or seminars as an adjunct to this activity, and suggests that the participation and expertise of the IUCN and other international organizations be solicited on a consultative basis.

It seems clear that the success of any conservation effort will depend heavily upon the training of professional and technical personnel necessary to carry out the objectives of the program. Wardens, game guards, and unit managers all must be trained. A wildlife management program must be developed and made part of the curriculum of a selected institution of higher learning in Egypt. This program should include sufficient field work to insure its viability. Institution building is similarly necessary, with an opportunity being provided for Egyptian faculty to take part in specially developed course work in the United States. It is the third recommendation of the Study Mission that training programs be developed including each of the factors described above. Again, the Study Mission is of the opinion that seminars and workshops can be effective adjuncts to the basic training program.

The fourth recommendation of the Study Mission is that Egyptian officials be asked to develop alternative project proposals directed toward raising public awareness and concern for conservation and the plight of the threatened and endangered species of Egypt and the means of protecting them.

The Study Mission encourages that excess foreign currencies available for this program be used to transport qualified Egyptian officials associated with the program to beneficial meetings and conferences for the purposes of broadening Egyptian contacts within the conservation community and exposing Egyptian officials to the interests and operations of non-governmental organizations in the United States.

APPENDIX II

LIST OF CONTACTS MADE BY THE STUDY MISSION

Hon. Ibrahim Shukri
Minister of Agriculture

Dr. Salah El-Abd
First Secretary
Ministry of Agriculture

Dr. Abdel Aziz Hussein
First Secretary of State
for Fisheries and Tudanese Affairs
Ministry of Agriculture

Dr. Abdel Monem Mohamed Ali
First Secretary of State for Animal Health
Ministry of Agriculture

Dr. Hassan Hafez *
Director, Giza Zoological Gardens
Cairo

Dr. Mohamed Abd-El-Rahim
Deputy Director, Giza Zoo

Mohamed Abd-el Fattah
Giza Zoo, Migratory Bird Banding

Dr. M. Fawzy Hussein
Dean-Faculty of Science
University of Cairo

Dr. Ibtesam Kussem
Faculity of Science - Head Dept. of Zoology
University of Cairo

Dr. A. E. Aboul-Nasr
Faculty of Science (Zoology)
University of Cairo

Dr. Nawal A. Ahmed
Faculty of Science (Zoology)
University of Cairo

Dr. Nasri Badir
Faculty of Science (Zoology-Endocrinology and Immunology)
University of Cairo

Dr. Mohamed Kassas *
Faculty of Science (Botany)
University of Cairo

Dr. Vivi Täckholm
Faculty of Science (Botany)
University of Cairo

Dr. Samir Ibrahim Ghabbour *
Institute of African Research and Studies
University of Cairo

Dr. Abdel K. Mansour
Vice Dean, Faculty of Science (Organic Chemistry)
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Dr. Khamis A. Abdel-Raheem
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University of Cairo

Dr. S. A. Abu-Sitta
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Assiut University

Dr. Kamal Wassif
Faculty of Science (Zoology)
Aim Shams, University

Taysir Ismail *
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Egyptian National Committee

Dr. Fatma Lotfy Youssef *
Dep. Director, National Institute of
Occupational Safety and Health
Cairo

Roushdy Anwar
Director General - Public Parks
Governate of Cairo

Dr. Fahmy Ramadan
Secretary General
National Research Center
Cairo

Dr. M. M. El-Fouly
National Research Center (Botany)
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Dr. Ahmed I. Naguib *
Head - Microbial Chemistry Lab
National Research Center

Dr. Sami Abd-el Salam *
Head - Environmental Research Division
National Research Center

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Dr. Harry Hoogstraal
Ibrahim Helmy
Sherif Tewfik
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Brookfield Zoo
Chicago

Mr. Stan Applegate
Deputy Chief of Mission - AID
U.S. Embassy, Cairo

Mr. Jos. W. Kovach
AID, Training Officer
U.S. Embassy, Cairo

Mr. James Riley
AID, Project Officer
U.S. Embassy, Cairo

From the IUCN, Morges, Switzerland:

Anthony Mence, Director of Regional Programs
Wee Lek Chew, Area Officer - South East Asia
Ray Dasmann (no longer at IUCN)
Pierre Hunkeler, Area Officer - Europe and North America
Felipe Matos, Area Officer - South and Central America

From the World Wildlife Fund, Morges, Switzerland:

Åke Jonsson, Director of International Relations
Pierre Portas, Conservation Project Planning

*member: Egyptian National Committee for Nature Protection