Arab Republic of Egypt
Ministry of Higher Education

World Heritage Center
(WHC)

UNESCO Cairo office
(ROSTAS)

CONSERVATION AND MANAGEMENT OF NATURAL HERITAGE IN ARAB COUNTRIES

Proceedings
of the
THIRD REGIONAL TRAINING COURSE
Cairo and Sinai, 26 May - 9 June 1995

Egyptian National Commission for UNESCO
Egyptian National MAB Committee

Cairo
1996

جمهورية مصر العربية
وزارة التعليم العالى

مكتب اليونسكو الإقليمى
بالقاهرة روستاس

مركز التراث العالمى
باريس

إدارة التراث الطبيعى وصيانته فى الوطن العربى

أعمال الدورة التدريبية الثالثة
القاهرة وسيناء ٢٦ مايو ـــ ٩ يونيو ١٩٩٥

اللجنة الوطنية لليونسكو
اللجنة المصرية لبرنامج الإنسان والمحيط الحيوى

القاهرة
١٩٩٦

Arab Republic of Egypt
Ministry of Higher Education

World Heritage Center
(WHC)

UNESCO Cairo Office
(ROSTAS)

CONSERVATION and MANAGEMENT OF NATURAL HERITAGE IN ARAB COUNTRIES

Proceedings
of the
THIRD REGIONAL TRAINING COURSE

Cairo and Sinai, 26 May - 9 June 1995

Editors
M.A. Ayyad, M. Kassas, S.I. Ghabbour

Egyptian National Commission for UNESCO
Egyptian National MAB Committee

Cairo
1996

جمهورية مصر العربية
وزارة التعليم العالى

مركز التراث العالمى
باريس

مكتب اليونسكو الاقليمى
بالقاهرة روستاس

إدارة التراث الطبيعى وصيانته فى الوطن العربى

أعمال الدورة التدريبية الثالثة
القاهرة وسيناء ٢٦ مايو - ٩ يونيو ١٩٩٥

المحررون العلميون

أ.د. محمد عبد الجواد عياد - جامعة الاسكندرية
رئيس اللجنة الوطنية المصرية لبرنامج الإنسان والمحيط الحيوى (الماب)

أ.د. محمد عبد الفتاح القصاص - جامعة القاهرة
الرئيس السابق للجنة الوطنية المصرية لبرنامج الإنسان والمحيط الحيوى

أ.د. سمير ابراهيم غبور - جامعة القاهرة
مقرر اللجنة الوطنية المصرية لبرنامج الانسان والمحيط الحيوى

ادارة العلوم والتكنولوجيا
اللجنة الوطنية المصرية للتربية والعلوم والثقافة

القاهرة
١٩٩٦

CONTENT

		Page
Acknowledgements		5
- **Preface**	**Mohamed A. Ayyad**	7
(1) A Practical Approach to the Preparation of Management Plans for Natural Heritage Sites	**Jim Thorsell**	11
(2) Reporting on the State of the World Heritage	**Harold K. Eidsvik**	27
(3) Suggesting Natural Heritage Sites in Remote Desert Areas	**Stefan Kröpelin**	35
(4) Characteristics of the Natural Heritage in the Arab World	**Kamal H. Batanouny**	43
(5) Arab Cooperation for the Protection and Management of Natural Heritage in the Arab World	**Anwar El-Khateeb**	53
(6) The Media and National Heritage Protection	**Awatef Abdel-Rahman**	65
(7) Conservation and Management of Natural Heritage and Nature Reserves in Egypt	**Essam El-Badry**	75
(8) Ras Mohamed National Park Sector	**Gen.O.M. Hassan**	99
(9) Zaranik Protected Area (North Sinai)	**Waheed Salama**	121
(10) Management of Nature Reserves in the Sudan	**Motasem Beshir Nimr**	127
(11) Nature Reserves Network in Morocco for Maintenance and Sustainable Management of Biological Diversity	**Abdel-Malek Benabid**	145
(12) Ecological Principles for the Management of Natural Resoruces	**Rafik El-Ghareeb**	155
(13) Ecosystem Simulation Models	**Mohamed S. Abdel-Razek**	167
(14) Biodiversity: Definition, Values and Causes of Impoverishment	**Manal Fawzi Ahmed**	175
(15) The Use of Geographic Information Systems, Remote Sensing and Databases	**Boshra B. Salem**	191
Summary Report		218

CHAPTER -3-

SUGGESTING NATURAL HERITAGE SITES IN REMOTE DESERT AREAS

*Stefan Kröpelin**

Although deserts comprise more than one fifth of the earth's surface and offer a natural and spiritual wealth to humanity, they host only few national parks. Most of these are situated in comparatively less arid Northern America (e.g. Grand Canyon National Park) and Australia (e.g. Ayers Rock NP). In the Sahara, the unrivaled desert of the earth, only 2.5% of its total surface of 8.6 million km^2 are protected by National Parks even though there are few competing demands. These are the Banc d'Arguin National Park in Mauritania, and the Aïr-Ténéré NP in northern Niger, and the Ahaggar and Tassili N'Ajjer NPs of Algeria which at present are hardly accessible to visitors.

Egypt and Sudan, Africa's largest countries in terms of population and area, respectively, do not have a single National Park in their desert lands though these constitute most of their territories and hold out outstanding potential for environmental conservation and economic development. Against this background, the present paper will try to explore the rationale and feasibility of protected areas programmes in the Eastern Sahara of Egypt and Sudan.

The Proposal for a National Park in the Gilf Kebir Egypt

The Arab Republic of Egypt covers a substantial part of the Eastern Sahara, one of the last regions on earth almost unaffected by human impact. However, most of its protected areas lie at the coasts and in the mountains of the Sinai peninsula, but none in the vast Western Desert proper.

Egypt's remote southwest corner is the core of the largest hyperarid area on earth and provides desert landscapes of great natural beauty.

* Free University of Berlin - GeoLab - Altensteinstr. 19 - D-14195 Berlin, Germany.

Owing to its distinct geomorphology, this region has been identified as the best terrestrial analogue to the landforms of planet Mars. It centers on Gilf Kebir, a solitary sandstone plateau the size of Corsica, and includes the northeastern part of the awe-inspiring massif of Jebel Uweinat, the highest mountain of the Eastern Sahara (1934 m a.s.l.). On the basis of these unique features, it is proposed to create a Desert National Park in the Gilf Kebir - Uweinat area (about 22°-25°N, 25°-27°E) and to name it "Gilf Kebir National Park" (GKNP).

The intended park area comprises the long, canyon-like valleys and the myriad of outlier hills of Gilf Kebir, the volcanic craters of "Peter and Paul", the Jebel Kamil inselberg, and the impressive longitudinal and barchanic dunes of the southern Great Sand Sea. The access zone provides scenic highlights such as the Abu Ballas escarpment and zeugenberg plains, the Selima Sand Sheet and the Abu Hussein dunefield, the oases of the New Valley, the Egyptian Plateau and the "White Desert" near Farafra.

Geological monuments range from superb sandstone sequences, meteorite impact craters, Paleozoic glaciation marks, Mesozoic tropical-wet soil formations, Tertiary volcanic flows to the early-Holocene play, and a deposits in Wadi El Akhdar and Wadi El Bakht, which have been singled out for their outstanding potential for prehistory and paleoenvironmental reconstruction.

Archaeological remains include the rock art of Wadi Sora and numerous Neolithic occupation sites, rich in pottery and lithic artifacts, which are among the last intact surface sites in the Sahara. As yet, negative effects from uncontrolled off-road tourism are moderate but increasing. The protection of Egypt's pre-Pharaonic archaeological heritage in the Western Desert, one of the origins of the Neolithic tradition and the Nile Civilization, may prove before long to be of utmost importance for its cultural identity.

The relict shrub and tree vegetation in the upper section of Wadi Abd el Malik and neighbouring valleys provides the last browsing and refuge area in the Gilf Kebir to support the remaining, highly endangered wildlife

and possibly even permits reintroduction of species highly adapted to waterless conditions (addax, barbary sheep).

A major outcome of the project would be the complementation of the country's classical tourist appeal by the development of nature tourism. Such a new concept of (eco)tourism has to be ecologically compatible but must also generate sufficient funds for sustainable conservation. Implementation of protection measures and tourism will back the economic development of shouthwestern Egypt by infrastructure improvement (access roads, landing strips, telecommunications etc.), and provide employment opportunities for the inhabitants of the New Valley (park staff such as wardens, rangers, guides, drivers, road maintenance workers; catering and accommodation).

Park facilities could serve as education centres for the public and as research platforms for multi-disciplinary, project-oriented investigations of extreme-desert dynamics. Ecological monitoring may focus on the biology and behaviour of desert wildlife and result in carrying-capacity studies for reintroduction schemes. Meteoro logical measurements will provide the first reliable data on the climatic conditions of the earth's most extensive hyperarid region.

The project thus concentrates on the conservation and sustainable touristic use of the most scenic part of the Egyptian deserts, and on the protection of major archaeological and geological sites.

Proposal for a National Park in the Wadi Howar Sudan

The Wadi Howar has been called the most remarkable natural feature of the southeastern Sahara. Its lower section (17°-18°N, 27°-31°E) proved to be a key area for the reconstruction of past environments and climates. Field evidence obtained along the 450 km long and 10 km wide valley has verified interpretations of satellite imagery of a now defunct watercourse which between 9500 and 3000 years before present was the Nile's largest tributary from the Sahara.

Africa's largest country in surface area, the Republic of Sudan, does

not own a single protected area in its desert and Sahelian zones, though these make up more than half of its territory. The existing Bandingilo, Boma, Dinder, Radom and Southern NPs all lie in the semi-humid savanna woodland zone of southern Sudan. Owing to the civil war, however, access to the south is extremely difficult and most of these reserves exist on paper only.

In view of this situation, and for geological, archaeological and environmental reasons, it has been proposed to gazette a geo-biosphere reserve in the southeastern Sahara and to call it "Wadi Howar National Park". The intended park area lies north and south of the Lower Wadi Howar, i.e. between 15°20' and 20°15'N, and 25°40' and 28°30'E, with a total surface area of almost 100 000 km^2. Its south-north-axis stretches some 550 km from the Sahelian zone into the hyperarid Saharan desert with annual precipitation averaging between 150 mm and 5 mm respectively.

Offering geological diversity, the proposed park area incorporates the northern part of the volcanic Meidob Hills with their impressive crater landscape; the metamorphic, partly ophiolithic Jebel Rahib complex; the extensive basement plains and inselbergs with their distinctive granitoid landforms north of the lower Wadi Howar; and the sandstone plateaus, escarpments and zeugenbergs of Jebel Tageru, Laqiya and Zolat el Hammad. The groundwater-supported Nukheila lake as well as the near-surface groundwater sites of the oases of El-Atrun and Laqiya Arbain are major scenic landmarks of the Eastern Sahara. More numerous and much more extensive are carbonate paleolakes or siliceous playa deposits of early to mid-Holocene age mostly eroded to aerodynamically shaped yardang fields. Large active barchan dune fields and trains liven up the hamada and serir surfaces.

As yet unaffected by uncontrolled offroad tourism, Northwestern Sudan offers abundant integral Neolithic and Paleolithic surface sites. Among the archaeological monuments to be protected are the rock art of Zolat el Hammad and Wadi Hussein; the outstanding prehistoric dune

habitats: the only recently discovered, presumably Meroitic fortress; grave mounds; hafir (water collecting) installations; and the Darb el Arabain, the most important ancient caravan route crossing the Eastern Sahara from Kharga (Egypt) to El-Fasher (Sudan).

In an unpublished report on a desert encroachment reconnaissance in Northern Sudan in 1975, it was suggestd to declare a game reserve or a national park further west in the upper part of the Wadi Howar to permit the survival and rehabilitation of desert wildlife and plant life. At that time, relict scimitar-horned oryx were on the point of extinction and the dorcas gazelle population was in urgent need of protection. In the meantime, however, hunting has continued and Oryx and Addax are presumably extinct already.

One of the main purposes of the proposed WHNP is therefore the preservation, rehabilitation or reintroduction of wildlife such as addax, oryx, dorcas and other gazelles, but also barbary sheep, ostrich, fennec, Ruppel's fox, and possibly jackal or striped hyena. Reintroduction of addax, for example, could be based on successful experiences in southern Tunisia and at the addax sanctuary in the Aïr NP. Birds are still relatively frequent, particularly in the surroundings of the oases and acacia groves.

The rehabilitation of wildlife requires the protection and preservation of the remaining shrubland and trees such as the highly resistant tundub (*Capparis decidua*) which is characteristic for the northern region. Cutting acacia trees for fodder or fuel must be prevented by providing alternative sources of fuel. The use of grasslands and the ephemeral "gizzu" vegetation will have to be appropriately managed to prevent their over-exploitation and destruction.

Conclusion

The protection and conservation of Southern Egypt's and Northern Sudan's natural, geological and archaeological patrimony require the immediate creation of protected areas programmes to prevent irreversible damage to some of the world's finest desert environments. Both regions

feature potential World Heritage and Geological Heritage Sites of outstanding scientific interest for the geological, environmental and cultural evolution of arid Northern Africa. At the same time, the protection of the sensitive environments at the margin of the Eastern Sahara would contribute to international programmes in desertification control under the World Desertification Convention. Compared to any other existing natural reserve in Africa, the near absence of population pressure is an important assumption for a successful implementation.

Supporting research activities may focus on a long-term monitoring of the dynamics of the hyperarid core of the Sahara and its southern boudnary under controlled conditions and possibly clarify the extent of natural desert encroachment, a much disputed problem in Global Change initiatives.

Without action, the last ungulate populations of the Eastern Sahara will have disappeared in a few years, desertification will progress, and the Stone Age legacy of the desert such as the spectacular Neolithic dune habitats be devastated.

The establishment of natural heritage sites in remote desert areas also means utilizing the economic potential or quasi-waste regions by the promotion of tourism. Desert tourism is a healthy and expanding industry and can generate the resources needed for sustainable conservation. Probably the potential of desert regions for the future will be realized better by the application of ecologically compatible tourism than by large-scale agricultural projects, exploitation of pasture by livestock, or groundwater-mining.

Almost 20 years of cooperative georesearch by Egyptian and Sudanese authorities and the Cooporative Research Project "Arid Areas" of the University of Berlin, and future cooperation within the new large-scale research project "Cultural and Environmental Change in Arid Africa" of the University of Cologne, entail the obligation to conserve the geological and archaeological resources and the landscape of Southwest Egypt and Northwest Sudan as the essential framework of environmental protection, and to enhance public awareness on that issue.

REFERENCES

Gabriel B., Kröpelin S., Richter J. & Cziesla E. 1985. Parabolic dunes at the Wadi Howar-Settlement and Climate of Northern Sudan in Neolithic Times. *Geowissenschaften* 3:105-112.

Kröpelin S. 1987. Palaeoclimatic evidence from Early to Mid-Holocene playas in the Gilf Kebir (Southwest Egypt). *Palaeoecology of Africa* 18: 189-208.

Kröpelin S. 1989. Investigations of playa sedimentation in the Gilf Kebir (Southwest Egypt). *Africa Praehistorica* 2: 183-305.

Kröpelin S. 1990. Lower Wadi Howar. *Berliner geowisseschaftliche Abhandlungen (A)* 120.1: 223-234, 256-259.

Kröpelin S. 1993. Geomorphology, Landscape Evolution and Paleoclimates of Southwest Egypt. In: Geopotential and Ecology of the Western Desert, Egypt, B. Meissner & P. Wycisk, eds.. *Catena Supplement*-Bd. 26: 31-66.

Kröpelin S. 1993a. Late Quaternary Environments of the Lower Wadi Howar (Southeastern Sahara / NW Sudan). *Berliner Geographische Abhandlungen* 54, 293 p.

Kröpelin S. 1993b. Environmental change in the southeastern Sahara and the proposal of a Geo-Biosphere Reserve in the Wadi Howar area (NW Sudan). In: *Geoscientific Research in Northeast Africa*, U. Thorweihe & H. Schandelmeier, eds., Balkema. Rotterdam, 561-568.

Kröpelin S. 1995. Consevatioon and sustainable use of desert resources: the need for a National Park in Northwestern Sudan. In: *Evaluation and Sustainable use of the Natural Environment's Potential in Arid Areas - Example from Northern Sudan*, Springer Verlag (in prep.).

Pachur H.-J. & Kropelin S. 1987. Wadi Howar: Paleoclimatic Evidence from an Extinct River System in the Southeastern Sahara. *Science* 237: 298-300.