

Ndumu Game Reserve,
P.O. Ndumu,
Zululand,
South Africa.
February, 1973.

CROCODILE SPECIALISTS GROUP OF I.U.C.N. NEWSLETTER NO. 8.

AUSTRALIA.

1) 'Crocodile Conservation in Australia.

The recently elected Federal Government of Australia within two days of Cabinet being sworn in, has brought down legislation to protect crocodiles by refusing the exportation of crocodile skins and products except those from farmed crocodiles.

The action has been taken since one State in Australia (Queensland) has, as all members of the Crocodile Specialist Group will be aware, steadfastly refused to enact legislation to protect its crocodiles. This has resulted in the excellent legislation of the State of Western Australia and the Northern Territory being of reduced value due to extensive poaching which is difficult to control across the huge unpopulated north of Australia.

The legislation is as follows: a) to refuse permission for the exportation of any crocodile skins either of the saltwater or freshwater variety; and b) to prohibit the exportation of products made from crocodile skins.'

Bob Bustard has also referred us to the following interesting book

2) "Conservation for Survival!" by Kai Curry-Lindahl
Published by Victor Gollancs Ltd., 14 Henrietta Street, London
VC2E 8QJ.

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Kai Curry-Lindahl uses Dr. Hugh Cott's information to show that the Nile Crocodile has been exterminated, commercially important fish have declined, and unwanted species have multiplied, to make a plea for its conservation.

He pointed out the hunting pressures on crocodiles and the poaching problem.

Kai Curry-Lindahl throws the problem back in our faces with the statement that this is a challenging conservation problem which calls urgently for a solution in the interests of the countries where crocodiles and alligators live.

H.R.B.

3.) THE UNIVERSITY OF SYDNEY - ECOLOGIST - CROCODILE RESEARCH PROGRAMME.

Biologist required to carry on general ecological work on the Australian Salt-water crocodile, especially population assessment and migration.

The Crocodile Research Programme under Professor H. Messel is a joint project between the University of Sydney and the Northern Territory Administration. The programme is well equipped for land-based expeditions and a 100 ton research vessel is under construction for marine and estuarine work.

It is planned to make extensive use of radio telemetric techniques in the study, and a Radio Telemetry Unit has been formed for this purpose, within the School of Physics.

Qualifications: degree in Science preferably with extensive field experience. Higher degree of PH.D. preferred.

The appointee will be expected to undertake extensive field work in the north of Australia often in remote areas and may be based on Sydney or Darwin. The appointee will have the status of a Professional Officer and commencing salary will be according to qualifications and experience.

Salary range: Grade I: \$4,863 - \$7,275 per annum (Austn currency)
Grade II: \$7,736 - \$8,319 per annum (" ")

The appointment will be for one year in the first instance with possibility of renewal.

Economy air fares to Australia will be allowed for appointee and family.

Applications, including curriculum vitae, list of publications and names of three referees should be sent to the Registrar, University of Sydney, N.S.W. 2006 by 1st April 1973. Further information is available from the Head, School of Physics.

4. Malaysia.

Mr. Ken Sims, whom some of you have already met, is interested in obtaining literature on crocodile breeding. "It is the hope that it will be possible to establish potential breeding groups of crocodilians here in Malaya and any information or tips that you could provide would be much appreciated".

Address: Ken Sims,
Prang Besar Estate,
Kajang. P.O. 205,
Selangor, MALAYSIA.

5. Florida: U.S.A.

Extract: National Wildlife: Feb. 1973 by Hal Harrison.
"I was on Ed Froehlich's livestock farm in Lake Park, Florida, which has been turned into a testing ground for a dramatic, but controversial, approach to saving the wild alligator.

The reasoning goes like this: Alligator poaching continues to be a big problem in all nine southern states the 'gators call home, even though it has been illegal since 1970 to sell any alligator product in the United States.

So the University of Florida hopes to yank the rug out from under the poachers by drying up their illegal markets for hides that go into belts, handbags, shoes and other items. Researchers are trying to find out if it is practical to produce and sell farm-raised hides, as well as restocking alligators in the wild.

Using some of Florida's 16,000 captive alligators as basic stock for the experiment and taking no alligators from the wild where they are held inviolate by both state and federal laws, the University believes it can solve present problems of breeding, hatching, holding, feeding, and marketing.

To check on the program's progress, I visited the largest and most involved research farm in Florida - Froehlich's 2,000 acre spread in Palm Beach County's prairie country. He raises 1,200 to 1,500 head of beef and dairy cattle on good pastureland but his farm also includes dozens of marshy areas with vegetation like custard apples and willow heads - natural habitat for alligators but useless for pasture. Many of these areas have been inhabited by alligators for centuries and he is converting them into fenced breeding areas.
Makes full use of land.

This farm is an example of good land use. With cattle grazing in the drylands and alligators living and propagating in the wetlands, full production can increase revenues with little change in land ownership costs.

Froehlich has fenced off a 200 by 300 foot area containing five man-made ponds stocked with adult alligators. Other breeding ponds are scattered in natural pasture areas. Last year, seven females built nests and laid a total of 215 eggs. To avoid predation, a major cause of loss in production of wild alligators, Froehlich removed the eggs from nests and incubated them at 85 degrees.

He put some clutches in washtubs filled with sawdust. Others were placed in mounds of kenaf or ambary (an East Indian plant grown for its moisture-retaining fiber). Baby alligators - about eight and one-half inches long - hatched in eight to nine weeks and were placed in holding tanks where they are fed ground fish for the first two years.

Alligator farmers have learned that semi-annual segregation according to size is important because larger individuals dominate the food supply, the smaller 'gators hardly getting a chance to eat. And as the alligators mature, size segregation becomes necessary to prevent cannibalism. One farm failed a number of years ago when 70 alligators of both sexes, five to eight feet long, confined in one large pen, reduced themselves to 12 in four years. Froehlich keeps adults (five years or older) in large fenced ponds until he can select the best specimens to release in breeding areas.

Farmers in the Alligator Research Project are experimenting with different foods to reduce feeding costs. Poultry from chicken farms, by-products from food processing plants, and frozen or fresh fish are among the foods used. Feed records are carefully analyzed by a data and records system at the university.

Froehlich feeds his 'gators frozen fish, which he buys for \$100 per ton. He estimates it takes 70 cents worth of feed to raise a three-foot alligator, about \$12 for a five-footer. Of course, there are expenses for labor, equipment, and utilities that must be figured in total costs.

For all its promise, alligator farming meets with less than unanimous approval in the ranks of professional wildlife management experts. Dr. Archie Carr, eminent herpetologist, recently said:

"Superficially it sounds good, but there is fuzzy thinking in it. I have yet to see or hear of a workable plan for any reptile ranch that shows in realistic detail how it expects to achieve a volume of production so great that it will do anything other than increase both demand and prices. If the enterprise is a commercial one, it will obviously do everything

possible to create new markets. Just as obviously, it will not be able to satisfy these, and so will exacerbate, rather than relieve, the predicament of the natural populations."
Survival at Stake.

Some people say that even with larger populations, the alligator is too noble an animal to be raised and sold like cattle or pigs. But the survival of the American alligator is at stake: Dr. Frank Craighead, Sr., a well-known ecologist estimates that in 1950 there were two million alligators in the Florida Everglades. Today he estimates that 98 or 99 percent of the population has been killed, mostly by poachers.

And many wildlife biologists and management specialists believe the only way to save the alligator in the long run is to harness the profit motive through legitimate alligator farming. They are convinced that if alligator farming can provide great quantities of skins at low prices, the market for high priced poached hides will be greatly diminished. They believe the flow of hides from alligators killed illegally can be limited by strict law enforcement and by perfecting the "bellyprinting" technique to certify legal hides (see February-March, 1972 issue of National Wildlife, page 18).

Johnny Jones, executive director of the Florida Wildlife Federation, state affiliate of the National Wildlife Federation is a strong supporter of the University of Florida's alligator farming project:

"I believe the greatest safeguard for the protection of wild alligator population will be in the alligator farms. There the product can be produced cheaper and, with proper safeguards, the poachers can be put out of business."

John S. Street, an alligator technologist who has studied and worked with alligators most of his life, currently co-ordinates the program and provides liaison between the University's School of Forest Resources and Conservation and the cooperating farmers - Ross Allen, Silver Springs; Clyde Hunt, Bushnell; Herman Brooks, Christmas; Owen Godwin, Kissimmee; and Ed Groehlich. Also involved are the Florida Game and Fresh Water Fish Commission and the Florida Department of Community Affairs.

Need Efficient production.

Attempts to farm alligators are not new- pioneer efforts were made in St. Augustine in 1887. Since 1935, Ross Allen, internationally-known owner of the Reptile Institute in Silver Springs, has spent \$71,000 on six farms in unsuccessful efforts to breed and raise alligators in captivity. In 38 years he produced baby alligators from eggs only nine times - a total of 270 youngsters costing \$ 263 each.

Yet Allen is so convinced that farming can be economically successful that he is involved today in the University of Florida's project, operating his Indian Prairie farm east of Ocala. In a 13 acre fenced marsh, Allen has provided nine ponds for 15 mature alligators.

If present methods of alligator farming can prove profitable, John Street and Ed Froehlich have the blueprints for highly efficient production. One end of a 50 by 100 foot farm building with fiber glass walls will accommodate the incubating eggs, the rest of the building holding young alligators. A constant temperature of 85 degrees will be maintained throughout the year, creating a condition that will accelerate the growth

of resident alligators. Such a facility would allow precisely controlled conditions for studying the nutrition and diets of rapidly growing alligators.

Dr. Roland A. Coulson, professor of biochemistry at Louisiana State University, has proved by experiments in temperature control that alligators fed all the ground fish they can eat for five days every week and kept at 85 degrees will be two and one-half feet long at the end of the first year and nearly five feet long one year later. Since normal growth of a young alligator in the wild is about one foot a year, Dr. Coulson's research is a boon to farmers who want to grow alligators quickly at minimum cost.

Other programs underway.

In addition to the research in Florida, alligator farming is being tried in Georgia and Louisiana. Participating farmers are licensed by the state and pay an annual fee for the privilege of operating. Crocodile farming is being attempted in Africa and New Guinea. The object in all cases is to produce crocodilians in captivity for commercial purposes without disturbing the wild stock.

If alligator farming can be proved economically feasible, southern farmers may turn millions of acres of marshland unsuitable for crop or livestock production into alligator production. Many of the animals would probably be bought by state conservation agencies to restock wild areas where alligators formerly lived.

However, such speculation is premature. Any predictions would have to be made on a long-range basis. As yet, farming is not economically feasible, and solving breeding and survival problems and developing production guidelines may require ten more years of research.

But the University's research program has been making progress, and is a good example of modern technology being used to help safeguard the existence of one of our more ancient and interesting wildlife species."

6. Papers Received.

a) A comparison of Four East African Crocodile Populations
by R.M. Watson, A.D. Graham, R.H.V. Bell and I.S.C. Parker.
East Afri. Wildl. J. 9: (1971) p. 25 - 34.

Summary:

Four crocodile populations have been examined by aerial photography with a view to assessing their length frequency distributions.

The assumptions, and the limitations attached to such assumptions, necessary to convert length frequency information into information on the age structure, and hence the status of the population are considered.

Environmental conditions of value in understanding the status of the populations are listed.

The Victoria Nile population is considered to show adequate recruitment, but dispersal of young crocodiles tends to give the converse impression. The population is probably stable and has not been heavily exploited in the past.

The Grumeti River population may represent a local aggregation mostly of large males from Lake Victoria, probably retreating from human induced pressures. There is little recruitment through breeding, and the largest crocodile

encountered in this study are members of this population.

The Lake Rudolf population is a typical healthy population with high recruitment and high juvenile mortality. The population is probably stable, but may be expected to decline as fishing interests on the west shore expand. Growth is retarded in the Rudolf population.

The Lorian swamp population is expanding rapidly probably after a period of heavy mortality wrought by hunters shooting for skins. The present conflicts with human/livestock interests is expected to increase, resulting in stabilization and decline of crocodile in the swamp.

Some comments are made on the possible influence of various environmental parameters on present status and trends of the populations.

7. Crocodile Distribution and Status in the Major Waters of Western and Central Uganda in 1969.

by I.S.C. Parker and R.M. Watson.

East Afri Wildl. J. 8 (1970) p. 85 - 103.

Summary:

1. This report presents the results of a survey into the current status of the Nile crocodile in the major waters of central and western Uganda, made on behalf of the Uganda Fisheries Department and the Trustees of the Uganda National Parks.
2. The waters covered by the survey are described briefly.
3. Crocodile numbers and distribution were assessed by diurnal aerial counting and nocturnal ground counts as described by Graham (1968). The major sources of error inherent in these techniques are recognised and discussed. Efforts to reduce bias in results included the use of a light helicopter to obtain data for comparison with those obtained from a conventional aircraft. Comparative costs are also presented.
4. Inaccessible areas of dense papyrus were searched at night from a helicopter equipped with a spotlight.
5. Information was obtained from fishermen in Lake Albert on the status of crocodile to corroborate other results.
6. The analysed results of aerial and ground counts give estimates of less than 100 crocodile outside the Murchison Falls National Park, indicating the species' reduction to the status of an 'occasional' or 'rare' animal. Within the National Park crocodile occur in two populations separated by the Murchison Falls. Below the Falls it is estimated that there are 1064 crocodile, and above 433.
7. By use of aerial photography 369 crocodile from the larger of the National Park's populations were measured for length. From Graham's (1968) age length data, age classes are ascribed to those measured. This, together with data from the counts, permitted the computation of a survivorship curve for the population. This is presented with two possible alternatives. From these curves it does not appear that the population is declining through lack of recruitment.
8. From the aerial photographs river banks are classified into four crude categories. By relating crocodile in the photographs to the nearest bank category, it is shown that they have a marked preference for sandy banks over swampy shores, hard flat earth or cliffs. It is also shown that smaller crocodile make more use of swampy areas than larger specimens.

9. Biomass densities for both crocodile populations in the National Park are computed. The larger shows a biomass of 347 kg/km of shoreline which compares with 350.2 kg/km for Lake Rudolf (Graham's (1968) data modified), the smaller 75.3 kg/km.

10. The decline of crocodile Uganda is attributed to expanding human populations and over-exploitation for skins.

11. Recommendations for the future conservation and management of crocodile are presented. These are based on reducing immature mortality rates by hatching eggs and artificially rearing small crocodiles for a period of 6 months after hatching. Some of these should be used to augment recruitment in the National Park populations, and the surplus placed in other waters until of an exploitable size.

TONY POOLEY.