AMENDMENTS TO APPENDICES I AND II OF THE CONVENTION

A. PROPOSAL

Maintenance of the Malawi population of Crocodylus niloticus in Appendix II subject to an annual export quota.

B. PROPONENT

The Republic of Malawi.

C. SUPPORTING STATEMENT

1. Taxonomy

11. Class: Reptilia

12. Order: Crocodylia

13. Family: Crocodylidae

14. Species: Crocodylus niloticus

15. Common Names: English: Nile crocodile
French: crocodile du Nil
Spanish: cocodrilo del Nilo

16. Code Numbers: -

2. Biological Data

21. Distribution: The Nile crocodile is widely distributed in Malawi concentrated along the lake shores, perennial rivers, and a few permanent pools in seasonal rivers. The current extent of crocodile habitat covers an estimated 1,316 km. of rivers and 894 km. of lake shores.

22. Population: The population of Nile crocodiles in Malawi in late 1984 was estimated at 28,300 (Anon., 1986). This estimate was an overestimate due to the fact that a high sighting rate of 10 crocodiles per km. of river or shoreline was used over the whole range of crocodile habitat. Sighting rates of 10 crocodiles/km. apply only to a small segment of the crocodile's range. A more extensive survey conducted in 1986 revealed an estimated minimum population of 4,600 crocodiles with an upper limit of 15,000 (Mphande, 1987). The overall average sighting rate was determined at 2.7 crocodiles/km. Due to the difficulty of homing on a definitive population estimate, a working population of 8,000 crocodiles has been used to determine the sustainable offtake. This figure was decided on because it is believed that the actual population is at least twice the minimum estimated as per the biases of the survey method used.

The annual recruitment has been estimated at 640 at an assumed sex ratio of 1:1 and a proportion of breeding females of 20%. The literature record that only 2% of all eggs laid grow into adult crocodiles (Pooley, 1982) has been used. The average

clutch size in Malawi is 40. This recruitment is considered to be the minimum and Malawi is requesting a quota of 700 crocodiles from the wild.

In addition to the wild population we have a ranched population of 780 crocodiles. This population is not completely independent of the wild population in that eggs are still collected from the wild. It is the intention of the Government of Malawi that a quota from the ranched population be included in the overall quota for Malawi. A quota of 200 crocodiles is requested.

The total quota requested by Malawi is for 900 crocodiles. All exports will be in the form of skins.

23. Habitat: Although increasing human population has an impact on crocodile habitat, especially nesting sites, there is still a lot of suitable habitat for crocodiles. The strongholds for crocodiles are swamps which are generally avoided by humans, hence crocodiles will continue to thrive. Furthermore a considerable amount of suitable habitat is preserved in the National Parks, Game Reserves, and Forest Reserves. Currently an estimated population of between 650 and 1,100 crocodiles is preserved in these areas. Crocodiles in protected areas are completely protected. They can only be killed in defence of human life.

3. Trade Data

31. National Utilization: The Dwangwa Crocodile Ranch was authorized to collect eggs from the wild as from 1984. An annual limit of 2,000 eggs was imposed. This limit has been reduced to 1,500 eggs annually following the 1986 survey. In addition to egg collection, Malawi has a limited number of licensed hunters who kill crocodiles. Each of the hunters was given a definite quota in accordance with the quotas approved by CITES under resolution Conf. 5.21.

32. Legal International Trade: In Malawi there is only one legal dealer and exporter of crocodile skins: The Cold Storage Company of Malawi (a parastatal organization). The decision to have a single dealer was designed to curtail illicit trade. The Cold Storage Company reports on a monthly basis all skins received and all skins sold, to the Government agency responsible for crocodiles. In 1985, 298 skins were exported out of 500 authorized under CITES. In 1986, the full authorized quota of 500 skins was subscribed.

No sale of live crocodiles is currently allowed in Malawi.

33. Illegal Trade: With one dealer in crocodile skins, illegal trade is unlikely to occur. In fact, the Malawi Government has not picked up any signs of illegal trade since 1967, when the decision to have a single dealer was made.

34. Potential Trade Threats:

341. Live Specimens: No trade in live specimens is allowed hence there is no threat.

342. Parts and Derivatives: The Crocodile Act (Laws of Malawi Cap. 66:06) requires an export permit for any part or derivative of a crocodile. Local market for crocodile skins is almost non-existent. This fact coupled with the fact that there is only one legal dealer and exporter of crocodile skins creates no incentive for illegal trade. The situation is therefore wholly under control.

4. Protection Status

41. National: The Nile crocodile is protected under the Crocodile Act (Laws of Malawi Cap. 66:06) which came into effect in 1968. Under the Act, no person may hunt, rear, or be in possession of any crocodile or crocodile product, or import or export any crocodile or crocodile product unless he is the holder of a valid licence or permit issued by the Minister responsible for the administration of the Act. The number of licensed hunters is strictly controlled and following the introduction of the quota system under CITES, the number of crocodiles that a crocodile hunter may shoot is also limited. On the side of trade, only one dealer is licensed to deal in crocodile skins and is the sole exporter. In National Parks, Game Reserves, and Forest Reserves no hunting of crocodiles or collection of their eggs is allowed except on the authority of the Minister. Such authority is only granted where it is established that the objective of the hunting or egg collection cannot be fulfilled elsewhere.

42. International: Malawi being a Party to CITES requires that all exports of crocodile skins are accompanied by appropriate CITES documentation and that each skin exported carries the relevant tag as per the marking system established.

43. Additional Protection Needs: None necessary at present.

5. Information on Similar Species

Only the Nile crocodile occurs in Malawi.

6. Comments from Countries of Origin

It is the consensus of the African states having crocodile populations that the Nile crocodile should be in Appendix II of the Convention. This spirit was clearly shown at the 5th meeting of the Conference of the Parties in Buenos Aires in 1985 and it is the general feeling that crocodiles remain in Appendix II.

7. Additional Remarks

71. Quota: Malawi requests to maintain its crocodile population in Appendix II with an annual quota of 900 crocodiles, 200 of which will come from ranched populations.

72. Marking System: The marking system established in 1985 will be continued.

73. Rationale for the Proposal: Malawi's crocodile population is stable with a minimum annual recruitment of 640 crocodiles. The quota requested from the wild population will in no way cause a

downward trend in the population. Furthermore, the government has committed itself to continuously monitor the trend in the crocodile population so that it is not unduly over-exploited.

A paper on the status of the Nile crocodile in Malawi is attached for further information.

8. References

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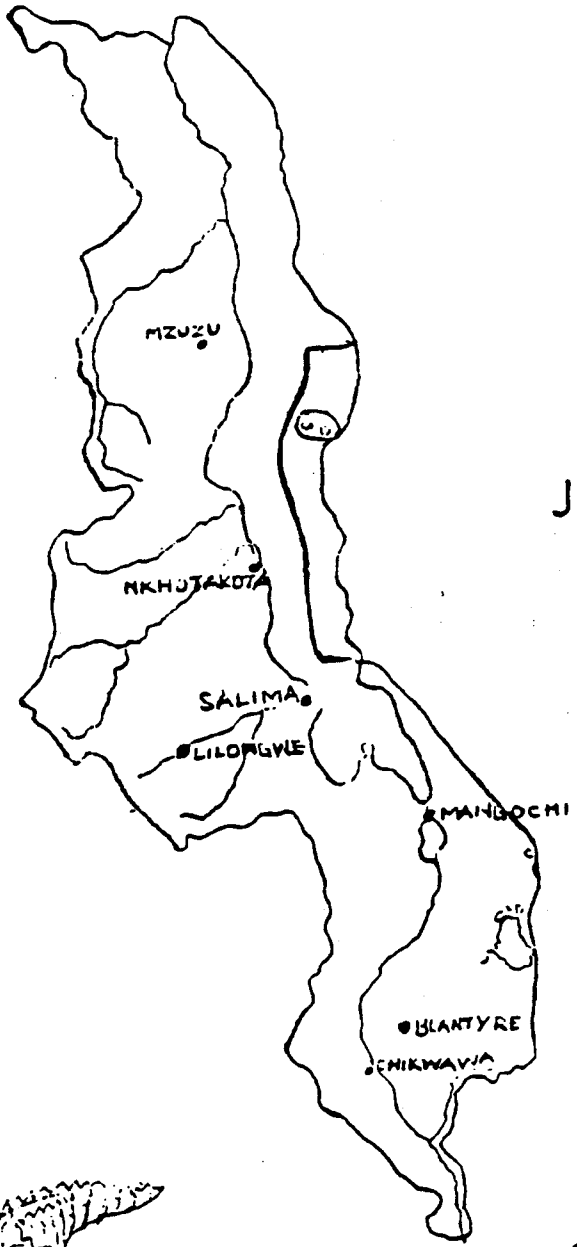
STATUS OF THE NILE CROCODILE IN MALAWI



by

John N. B. Mphande

STATUS OF THE NILE CROCODILE IN Malawi

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JANUARY, 1987

TABLE OF CONTENTS

ABSTRACT

The status of the nile crocodile (Crocodylus niloticus) in Malawi is summarized. Legal protection, habitat, government policy and utilization patterns are discussed. The population of crocodiles is estimated at a minimum of 4,600 with an upper limit of 15,000. Due to the unreliability of the estimate method arising from different biases, a working population of [illegible] is used to determine the sustainable offtake from the wild population. An analysis of the hunting returns reveals that the population has been stable over the past 10 years. The possibilities of improving crocodile conservation and management to ensure survival of the species are discussed and six recommendations are made.

INTRODUCTION

(a) BACKGROUND INFORMATION

(i) LEGAL PROTECTION

The nile crocodile (Crocodylus niloticus) is protected under the Crocodile Act (Laws of Malawi Chapter 66.06) which came into effect in 1968. The act replaced the Crocodile Ordinance of 1951. Under the Crocodile Act no person may hunt, rear, or be in possession of any crocodile or crocodile product, or import, or export any crocodile product unless he is the holder of a valid permit issued by the Minister of Forestry and Natural Resources. The day today administration of the Act is under the charge of the Chief Fisheries Officer.

The Crocodile Act does not provide for setting aside areas for the protection of crocodile habitat. This aspect is taken care of by the other Acts such as the Game Act, National Parks Act and Forestry Act which provide for setting aside game reserves, national parks, and forest reserves respectively. In such areas the nile crocodile is completely protected and any habitat contained is also protected.

(ii) GOVERNMENT POLICY ON CROCODILES

The provisions of the Crocodile Act have been translated into a national policy. The official government policy with regard to crocodiles is as follows:

(a) to so manage the exploitation of crocodiles in Malawi that;

1. human life is not put at undue hazard,

2. the development of its fisheries is not hampered,

3. the maximum sustainable return in forms

presented here are from a field survey conducted between September and October, 1986 and inspection of records held at the Fisheries Department Headquarters and the Headquarters of National Parks and Wildlife Department.

CROCODILE POPULATIONS

Two types of crocodile populations are recognised viz. Wild populations and ranched populations. These two types of populations are dealt with separately.

(a) Wild Populations

(i) Estimates

Methods

The survey area was divided into different segments based on the habitat type, settlement patterns, and utilization level. There are two basic components: the lake and the rivers. The lake was divided into rocky shoreline and clear or marshy shoreline. The two subdivisions were further subdivided on basis of settlement. The rivers were futher divided into clear shoreline and marshy shoreline. Futher subdivisions were patterns and utilization level.

Crocodiles were counted from a boat at night using a spotlight. All crocodiles spotted (crocodile eyes gives a deep red shine in the light) on a stretch of shoreline were recorded and a sighting rate determined. The stretches surveyed were stratified so that as many habitat types as possible were surveyed during the study. The choice of survey areas was done from 1:250,00 topographic maps. Determination of similar habitat types and settlement patterns was also done from the topographic maps. Distance used in the sighting rate determination are map distances.

Results:

The results of the survey are given separately for each of the three regions of the country.

1. Southern Region

(a) The Lake

Only the rocky shoreline between Golden Sands Camp Site to the mouth of Lisangadzi river was surveyed. No Crocodiles were seen on this stretch.

It was planned to survey the area between Matewele (where the Shire leaves the lake) to Club Makokola but this segment was not sampled due to bad weather. The segment would have represented clear shoreline with heavy settlement.

On the western arm of the lake the plan was to go as far down as Malembe to cover shoreline with light settlement. This segment was not fully covered due to the distance involved

A survey was carried out on the Shire between Matewele and Mangochi Bridge covering one shoreline at a time. On the eastern shoreline 15 crocodiles were counted giving a sighting rate of 1.5. crocodiles/km.

the habitat is not ideal for crocodiles except at confluences with other rivers and streams. Although this segment was not surveyed the sighting rate should be lower than the upper Shire and lower Shire even though this segment is generally not settled. A sighting rate of 1 crocodile/km of river has been used giving a population estimate of 70 crocodiles.

(c) Ruo River

Crocodiles have been reported on the Ruo in areas below the rapids down stream from Sankhulani. The sighting rate for the main Shire river channell has been used i.e. 1.9 crocodiles /km. The population estimate derived is 34 crocodiles.

SUMMARY OF POPULATION ESTIMATE IN SOUTHERN REGION

SECTION	LENGTH	SIGHTING RATE	POPULATION
Boundary Pillar 17 to Matewele	150 km	1.5/km	225
Matewele to Monkey-Bay	56 km	1.0/km	56
Lisangadzi to Nankolukolu	24 km	1.5/km	36
Matewele to Lake Malembo	16 km	2.5/km	40
Lake Malembo	72 km	1.5/km	108
Liwonde National Park	75 km	4.25/km	319
Likwenu to Matope	70 km	2.0/km-	140
Matope to Kapichila Falls	70 km	1.0/km.	70
Kapichila Falls to Chiromo	105 km	1.9/km+	200
Chiromo to Nkupila	87 km	1.9/km	165
Elephant Marsh	498 km	2.7/km	1345
Ndindi Marsh	87 km	2.7/km	235
Ruo from Rapids Below Sakhulani to Confluence with Shire	18 km	1.9/km+	34
TOTAL			2973

+- Sighting rate per kilometre of river as opposed to shoreline.

Nkhotakota Game Reserve:

Bua	40 km	3/km	120
Kaembe	35 km	1/km	35
Dwangwa	30 km	1/km	30
TOTAL	105 km	5/km	185

River Channels:

Nankolukolu	3 km	9/km	27
Bwanje	3 km	9/km	27
Mpatsanjoka	3 km	9/km	27
Kaembe	3 km	9/km	27
Dzaza swamp	10 km	9/km	90
Bana swamp and Nkana swamp	30 km	9/km	270
Kalali swamp	6 km	9/km	54
Chia Lagoon	6 km	9/km	54
TOTAL	64 km	72/km	576

OVER ALL TOTAL POPULATION = 1130

3. Northern Region

No survey was done in the Northern Region. Sighting rates obtained in the Southern Region and Central Region surveys were applied to similar habitat with similar settlement pattern in the Northern Region. The estimates are summarized below:

SUMMARY OF CROCODILE POPULATION ESTIMATES IN NORTHERN REGION

	Length	Sighting Rate	Population Estimate
Dwambadzi to Ndawambe	25 km	0.75/km	19
Ndawambe to Nkhata-Bay Boma	60 km	0.75/km	45
Nkhata-Bay Boma to Chandagha	15 km	0.75/km	11
Chandagha to Bweteka	20 km	0.75/km	15
Rukulu point to Songwe	145 km	0.75/km	109

rivers is also variable hence making it impossible to maintain the same distance from the shore in all survey areas.

Chances of spotting crocodile eyes decrease as you go further from the shore. Some Crocodiles were spotted from among the reeds when navigating very close to shore such crocodiles were obviously missed when navigating futher in shore. In alot of cases, especially on the lake, where big boats had to be used navigating was further in shore hence sighting rates obtained are under-estimates. At river mouths the situation was even worse due to the large sand deposits from the rivers making the lake particularly shallow. Where we managed to get into the river mouth e.g. at Kaombe the sighting rates were very high, i.e. 9 crocodiles/km.

In the rivers, navigating was again difficult due to shallowness particularly at confluences. Another complication were the weeds which would choke the out-board engines making alot of side channels within the river to be in-accessible. The sighting rates in those areas are again underestimates in almost all cases. Where back water were sampled, the sighting rates were at least double those of the main channel. The crocodiles use the back waters as their refuge since the main channels are subjected to a lot of traffic.

(ii) Crocodile Behaviour

The crocodile's sight is very sharp both to the sides and to the front. It also has a superior sound perception in the range from about 100 to 4,000 hertz (cycle per sound) (Pooley and Gans 1976). With these devices it is possible that some crocodiles went under water soon after picking the sound and seeing the search light. Light seems to be a more critical factor than sound particularly where hunting intensity is high. The effect of sound seems to be rather minimal as crocodiles have been approached to within 5 metres with a boat propelled by a 12 horse power in-board diesel engine. Some crocodiles must have been missed out due to their behaviour of sub-merging themselves in time of danger hence resulting in an underestimated sighting rate.

(iii) Sampling Intensity

The total stretch of both rivers and lake shores sampled is very small. A total of 125 km were covered on rivers and 84 km on lakes and lagoons these are only 9.5% and 9.4% respectively of the total suitable crocodile habitat identified. This sampling bias can go either way i.e. over estimating or under estimating. The greater the number of sample in different habitat types the more accurate the estimated sighting rate would be. For example the Kaombe river mouth estimate of 9 crocodiles/km may not be reprentative of other river mouths. There was need to sample more river mouths to come up with a more representative estimate. Financial constraints and the practical difficulties of getting into some river mouths made it impossible to obtain more than one sample. This estimated sighting rate is likely to be a little high hence the overall population estimate in areas where this sighting rate has been used is also high. On the other hand the sighting rates determined on the lake were from a small segment of the lake. The sighting rates might be high or low

which are vital in such study. The crocodiles found on sand banks are normally nesting females. Young crocodiles tend to hide in the reeds and bask in isolated areas which are not easily accessible. I therefore had to resort to literature on recruitment rate to come up with an estimate of annual recruitments in the Malawi population. To supplement this information regarding vigour of the population I analysed the hunting returns to see if there has been any change in the distribution of skin length over the years. The null hypothesis being tested is that there is no change in distribution of skin lengths over the years which is indicative of a stable population in the face of hunting pressure. The alternative hypothesis is that there is a change in the distribution of skin lengths which is indicative of a changing population in the face of hunting pressure. The assumption made is that hunters' tastes have remained the same over the years and that the hunting methods used are none selective apart from conforming with the legal limit that crocodiles of less than 5ft. (15 cm.) should not be hunted.

Results and Discussion

Pooley (1982) report that of all eggs laid only 25% grow into adult crocodiles. The average number of eggs laid per female per year is put at 60 by Ross (1962). In Malawi the average nest size is 40 eggs (P.M. Strover, personal communicating). With a base population of 8,000 crocodiles the annual recruitment is 640 crocodiles if a sex ratio 1.1 and a percentage of breeding females of 20% are assumed. It is normal in most populations to have more females than males. Also the percentage of breeding females is likely to be on low side. Hence the recruitment rate of 640 crocodiles should be considered as minimum.

On the the vigour of the population an anlysis of distribution of skin lengths was made for the years 1977 to 1985. The results are summarized in Table 1.

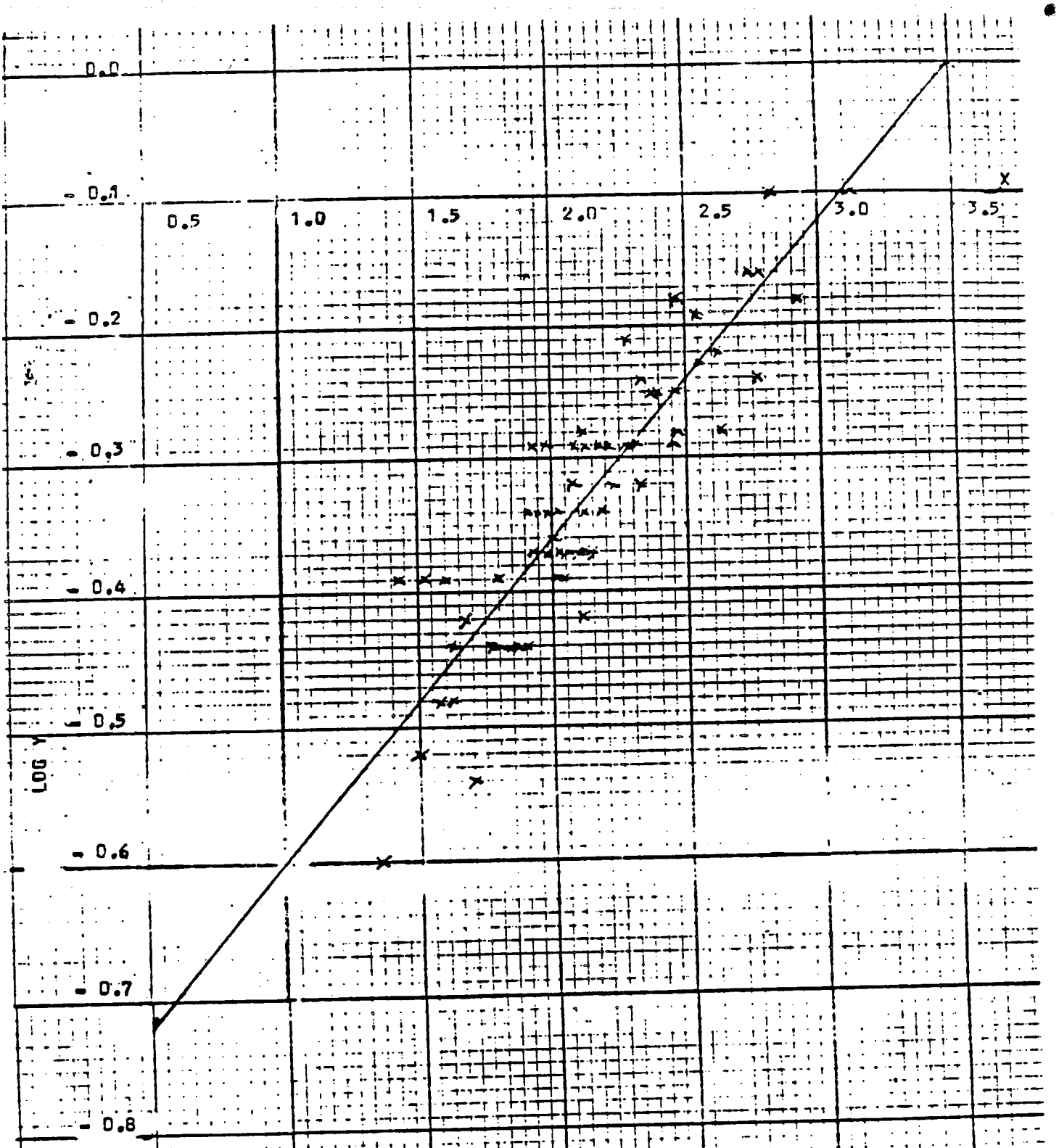

Fig. 1: Relationship between skin length and belly width. Equation of regression line is Log Y = - 0.84 + 0.24 X
Where Y = Width of skin at the belly (measured in metres) and
X = Length of skin (in metres)

The equation can accurately predict belly width for skins of 1.5 to 3.00 metres. Outside this range the predictions are bound to be inaccurate due to the low number of points included in the calculation 1, 0, 3 out of 70.

then picked from a 1:25,000 map. Across of the same physiography and similar settlement pattern were deemed to be the same in terms of suitability for crocodiles. The main objective of the survey with respect to habitat was to record suitable habitat for crocodiles and identify activities that are incompatible with crocodiles conservation. In general an assessement of the trend in crocodile habitat was envisaged.

Results, Discussion, and Conclusions

Crocodile prefer marshy areas or reed banks or beaches in addition to open water. Rocky shoreline are not ideal for crocodiles as these will not offer suitable nesting sites. Crocodiles need sandy beaches or mud banks as nesting sites. Crocodiles will also burrow into mud banks during cold weather to conserve energy. Prey species, both aquatic and terrestrial, have to be present in the area for the site to be preferred.

Unfortunately the crocodile's choice of habitat coincides with the human choice leading to direct conflicts. Sandy beaches are beat yards for fishermen. Thay are also used as recreaction areas at tourist resorts. The result is that crocodiles have been driven out of most of these areas. Hence crocodiles have retreated into remote areas with respect to human settlement. It is in these areas that ere crocodiles breed and survive. With increasing human population even these areas might in time become unsafe for crocodile habitation.

On the Lake shore starting from the south west of the lake in the south to the north at the mouth of Songwe River, there is dense settlement with tourist areas dotted all over the Lakeshore. In this segment, crocodiles only survive in marshy areas with small islands. These marshy areas or swamp are normally associated with river mouths. However, in swamps where islands of substantial size are available, the islands are used for rice growing or multiple maize crops (dimba cultivation) hence infringing on crocodile habitat. The population of crocodiles in this area, i.e. south west arm of Lake Malawi, central and Northern Regions, is less than half the population of the south - east arm and the Shire River system (about 32% of the total population in in the country).

A consequence of the low population density is the relatively low frequency of crocodile damage to human life and property in the area. Less of human life was not reported from any of the areas in question. Injuries and threats to human life have been reported from Nkhata-Bay in 1986 in areas of local concentrations of crocodiles such as Limpasa, Lweya, and the islands of Chizumulo and Likoma. Damage to fishing nets were reported from Kasanga-Bay in Mangochi District, Kuluunda area in Salima, Chia Lagoon and Bana Swamp in Nkhotakota and Dwambadzi in Nkhata=bay. Livestock injuries and losses are not normally reported as these tend to be every occurances.

In the south-east arm of the lake and the Shire River system. density of settlement is relatively low. Even with high human settlement, crocodiles still have a chance to survive as a consequence of the pattern of swamps and islands in the Shire River. The back waters in the Shire are generally woody hence detracting fishermen from setting nets in the areas. The size of the islands are generally small hence not conducive to rice growing or dimba cultivation. It is

TABLE 2 : TRADE STATISTICS FOR CROCODILE SKINS : 1976 TO 1985 K = MALAWI KWACHA : + INCLUDES 211 PIECES

YEAR	COUNTRY OF IMPORT												
	ZIMBABWE		W. GERMANY		SWITZERLAND		FRANCE		MALAWI		TOTAL		
	No. of Skins	Value K	No. of Skins	Value K	No. of Skins	Value K	No. of Skins	Value K	No. of Skins	Value K	No. of Skins	Value K	Av. Price Per Skin K
1976	432	4,709.25	-	-	-	-	-	-	-	-	432	4,709.25	10.90
1977	-	6,053.45	-	-	115	5,702.00	-	-	29	351.45	-	12,106.90	-
1978	170	9,702.00	-	-	80	4,470.00	69	3,538.00	14	108.00	333	17,818.00	53.50
1979	-	14,629.00	-	-	234	14,629.00	-	-	5	-	-	-	-
1980	136	8,531.00	-	-	-	-	-	-	-	-	136	8.531.00	62.73
1981	777	46,413.09	-	-	-	-	-	-	-	-	777	46,413.09	59.73
1982	718	68,662.00	-	-	-	-	-	-	-	-	718	68,662.00	95.63
1983	935	80,896.00	-	-	-	-	-	-	-	-	935	80,896.00	86.52
1984	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	298	-	-	-	-	-	298	-	-	-	298	-	-

population is substantial. Sixty-seven nests of 40 eggs each would have to be excavated. The ranch should be encouraged to establish its own breeding stock to relieve pressure on the wild population. Currently they have 13 breeding adults of which only 2 are females. There is need for the ranch to capture at least 10 females initially as a nucleus breeding stock. The production target can only be reached after 5 to 10 years of operation at which stage the ranch might have a sufficiently large breeding stock. In the meantime the ranch should be restricted in its egg collection to no more than 1,500 eggs annually.

GENERAL CONCLUSIONS AND RECOMMENDATIONS

Malawi's crocodile population is stable at a minimum of 4,600 crocodiles. The upper limit for the crocodile population is 15,000. A working population estimate of 8,000 crocodiles has been decided on. With a base population of 8,000 crocodiles on annual recruitment of 640 crocodiles is achieved at a sex rate of 1.1 and a proportion of breeding females of 20%. The assumption is that only 2% of all eggs laid grow into adult crocodiles. This annual recruitment should be considered as minimum.

In accordance with the government's policy of maximizing benefits from crocodile utilization while minimizing the negative impact of crocodiles on other forms of development and being mindful of the neeed to preserve the nile crocodile from extintion in Malawi, the offtake from the wild population has to be large enough to maintain life and property is minimal and reduce the population sufficiently in areas where damage to human life and property is still rampant. I therefore recommend that Malawi applies for a quota of 900 crocodiles to CITES. Seven hundred of those will come from the wild population and 200 from the ranched population. This is my first recommendation.

Licenced crocodile hunters are given equal quotas based on the fact that the fee for the license is the same. However, the crocodile populations in the different hunting areas is different resulting in present recommendation of 700 crocodiles from the wild is taken then each of the 13 hunters licensed in 1986 (assuming all will have their licenses renewed) would have a quota of 54 crocodiles. If we are to maintain the crocodile population in the northern region and central region and also the population of crocodiles in the south and of the lake including river Shire up to Kapichila Falls at the present level the number of hunters in these areas has to be reduced. My recommendation is as follows: One hunter in northern region concentrating his efforts in the Nkhata-Bay area, 3 hunters in central region, 1 hunter in the south - east and south west arm of the lake including Shire River to Matewele Village, 1 hunter from Matewele to Matope Bridge, and the hunter from Matope Bridge to Nchalo has to be maintained. This is recommendation 2.

In view of the high losses of human life in the Lower Shire Valley particularly Chikwawa District, the number of hunters in this area has to be increased in order to reduce the crocodile population sufficiently hence minimising damage. My recommendation is that the number of hunters be increased from the present 3 to 6. At least

I.M. Jagot, W.M. Hassan, W. Salimu, and A.L. Hassan (all crocodile hunters) for their co-operation in providing information on crocodile distribution and damage cases. To Mr. A.L. Hassan a special thank you for joining us on part of the survey. Very special thanks go to Mr. O.G. Mkandawire, Parks and Wildlife Assistant (R) and C. Kamanga (driver) for their support and hard work during the survey. Without their untiring efforts the survey would not have been as smooth running. My thanks also go to the following employees of the Department of National Parks and Wildlife for various assistance: H.E. Nzima, S.M. Munthali, T.K.G. Shaba, D.E.C. Mughogho, P.C. Mbota, F. Kamoto, C. Gawanika; and J.Van Gilder.

Sincere thanks go to Mr. P.M. Strover and H. Theobalt: Fields Manager and Agriculture Manager at DWASCO respectively for information on the ranching operation and for comments on thesurvey in general. The Officers in-charge of Chikwawa, Liwonde, Salima, and Nkhotakota Police Stations are thanked for their co-operation in providing information on loss of human life and damage to property in general. Lastly my very special thanks go to Mr. M.T.L. Kumpumula, Chief Parks and Wildlife Officer, for his untiring support and guidance.

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