

N Y A S A L A N D



P R O T E C T O R A T E

# Annual Report of the Department of Game, Fish and Tsetse Control for the year ending 31st December, 1952

## A. STAFF AND GENERAL

1. The year was a somewhat anxious one for the Department as a whole, for during the greater part of it Government was considering, in accordance with a recommendation of Standing Finance Committee, the possibility of its being abolished and its functions absorbed by the Departments of Agriculture and Veterinary Services. Decision on the point was not given till the closing months of the year and though no proposals for actual retrenchment of staff were mentioned in the original recommendation, a feeling of anxiety was inevitable and persisted until the die was cast. Eventually it was decided to make no changes at present.

2. The establishment of the Department was considerably reduced during the year, the number of Game Control Officers being reduced from four to three with the completion of Mr. Lindsay-Smith's contract in April, while the posts of Fish Ranger and second Tsetse Ranger were placed in abeyance when Messrs. Dunlop and Arnold completed contracts in March and June respectively. Mr. Harington, Tsetse Survey Officer, also resigned during the year.

3. Mr. Mitchell, Tsetse Entomologist, returned from leave on 29th May and Mr. Muldoon, Game Control Officer, was on leave from 1st May to 26th December. Messrs. Lewis and Graham, Tsetse Survey Officers, went on leave pending termination of agreement, at the end of December.

4. The staff position as at 31st December is set out in Appendix I.

## B. GAME

5. The reduction in the Game Control Officer establishment, coupled with the simultaneous departure of one officer on long overdue leave, left the Game section with only two officers from May onwards, and it was difficult to work very systematically with so few. In the main the policy was to lay less emphasis on vermin and rather more on dangerous game beyond the scope of the average villager, than has hitherto been the case. This, together with the shortage of field officers inevitably meant some decline in mere numbers of animals dealt with, though much valuable work was done.

6. The shift of emphasis was a matter of decided policy, not solely dictated by the shortage of officers. The intention is to replace the activities of the armed, centrally paid, hunters by those of district vermin control teams made up largely from the inhabitants of the various infested areas, controlled by the local authorities and eventually financed by them. Progress in establishment has not been as rapid as was hoped, but it is considered essential that these local efforts should be developed and the attempt will continue.

7. The shortage of officers and lack of housing in the Northern Province made it impossible to station an officer there after April, when the establishment was reduced. From May onwards, therefore, the effort had to be again restricted to that of skeleton teams operating under District Commissioner Rumpi, and Tsetse Ranger, Karonga. The Rumpi team accounted for a number of elephant and, in a restricted area, did useful work. In the main, however, little more than a token effort could be made.

8. The inhabitants of Nkata Bay District continued, under the stimulus of bounty payments, to do good work against vermin and disposed of some 2,960 head.

9. In the Central Province the main effort was devoted to keeping dangerous animals within the confines of the Reserves, keeping the Kasungu resettlement area free from dangerous animals and to extending the system of district vermin control teams. No great success attended this latter effort but the team established on the Dowa Lake-shore last year was successfully maintained. Vermin destruction by the armed hunters continued, but for the reasons stated above, emphasis on this was much reduced. Personnel of the Central Province teams also took part in the drive against elephant in the Central Shire Valley, mentioned below.

10. Under the stimulus of the exhortations of the Game Control Officer, Kota-Kota and the system of bounty payments, the inhabitants of Kota-Kota and Dowa Districts made a better contribution to vermin destruction than previously and accounted for some 1,660 head. Unfortunately, this type of effort declined in Fort Manning District.

11. The Southern Province team was divided into two portions during the first part of the year, one small team under a Senior Guard being left in Chikwawa District to keep elephant from coming down from the hills into the cotton lands of the Mwanza Valley, and the other, accompanying the Game Control Officer in the attacks on vermin, hippo, etc., in the rice lands east of Lake Malombe and in the Central Shire Valley. In the second half of the year the team was united again and changed its base to Dedza for the remainder of the year. From this base attacks were made on vermin in the Bwanje Valley and other low-lying parts of the southern end of Ncheu District and, from July to October, on the elephants on the Liwonde-Mpimbe area of the Central Shire Valley. During the period of attack on the central Shire elephant, the Game Control Officer was able to start a district vermin control team in that area.

12. The effort in the early part of the year in Chikwawa was very successful and on practically all occasions elephant were turned back into the hills before they had done any significant damage.

13. The attack on the elephant in the central Shire area achieved its main object, namely the drastic reduction of numbers. Shooting was broken off when the survivors consisted of cows and calves only. Unfortunately, these Central Shire herds are not living in connection with any sanctuary into which they can well be driven, nor, being largely tuskless and of bad reputation for ferocity, are they attractive to the private hunter. They cause continual damage to crops and there seems no alternative but to keep their numbers severely in check.

14. The details of animals destroyed and African Staff employed are set forth in tabular form in Appendix II, while the direct revenue, accruing as a result of crop protection operations, is shown at Appendix III. Revenue from sales of meat would have been much higher had not many of the elephant been shot in predominantly Mohamedan areas, where there was very little demand for the meat. Furthermore, considerable quantities of meat were handed over to the Native Administration without charge.

15. Crocodile destruction by Government was abandoned after the end of March and the field left clear for commercial hunters. Five licences were issued, but only in two cases did the licensees make a very serious attempt to exercise their privilege. One of these was compelled to abandon his effort by the shipwreck of his launch. Nevertheless, the remaining licensee was fairly successful and was able to persuade quite a number of Africans to catch and sell skins to him. A total of 1,141 reptiles were dealt with by commercial licensees during 1952.

16. There is little of moment to report concerning the question of game conservation. The revision of the boundaries of Kota-Kota Game Reserve were still under consideration by Government as was the question of a new Game Ordinance. The departmental draft of the latter was, however, passed for circulation to Provincial Commissioners and other interested parties, to clear up any controversial points before legal drafting began. A formal Bill is now awaited.

17. The shortage of Game Officers prevented very much field effort in the conservation aspect of Game Control, beyond the safeguarding of the Reserves, but this latter was carried on as far as limited staff permitted. The checking of hunters' licences also continued as opportunity offered. Appendix IV tabulates the licences taken out during 1952 and shows a slight increase on 1951 figures. The number of licences, however, still falls far short of the firearms registered.

18. Reports from the Game Reserve Guards continue to indicate a respectable game population in the Reserves, particularly Kota-Kota, where in the course of a single day the Tsetse Entomologist saw seven species and 69 head in all, together with fresh spoor of rhinoceros and buffalo.

### C. FISHERY

#### *State of the Fish Stocks:*

19. The main commercial fishery, namely ring netting for the off-shore species of Tilapia, shows a heartening increase in catch per single haul of net, with little variation from 1951 in the total number of pulls. This naturally resulted in a considerably increased catch and it would appear that the stock of this species is at a fairly satisfactory level, at least in the S.E. arm.

20. The African fishery for the inshore species was not so successful however, and the slight improvement which appeared to have been made during 1951 does not seem to have continued generally. The actual data collected show no very definite overall difference from those of 1951, but there was no significant increase of effort by the fishermen, such as usually reflects marked increase of abundance of fish. All in all, the stock of the inshore species appears to be moderately static, but at a rather low level compared to ten or twelve years ago.

21. Systematic observation of the Mpsa fishery of the Karonga Rivers indicate that it is less continuous and destructive than a casual glance at the serried ranks of trap fences suggest and that the enforcement of a gap in the fences may well be unnecessary. Even the imposition of a small gap is said by the recorders to result in, not merely a reduction of catch, but an elimination of it, though this statement is not fully borne out by the records.

22. It has, however, been difficult to collect adequate and continuous data because of the resentment aroused by the threat of a gap, coupled with the recent imposition of an increased tax by the Native Authority.

23. Labeo and Clarias catches showed a rather sharp decline in catch per unit effort in the non-African gill net fishing, compared with 1951, but an increased total landing owing to a much greater effort. This type of gear is usually responsible for most of the Clarias and Labeo catch. Catches of these species in African shore seines were not markedly different from those of last year.

#### *The non-African Fishery:*

24. Commercial licences were issued to five non-African firms for the 1952-53 season but only two were actually in action on 31st December. Of the remaining three only one appeared to be making really vigorous efforts to get started. This fishery is to be sited in the Central Province Waters. As in so many Lake development projects the lack of large boats produced locally, seems to be a major obstacle.

25. Both the non-African firms established at the beginning of the year fished with good success and it is plain that the introduction of the 4 ins. mesh for ring nets has not proved any hardship to them, in spite of the fact that the catching of the smaller inshore species of Tilapia has been inhibited by it. Total landings of all species were estimated at 1,977 short tons in 1952 as against 1,278 in 1951.

26. Both concerns made preparations for expansion of activities and as far as the question of catching fish is concerned prospects in the S.E. arm appear satisfactory.

27. Data for the non-African fishery, still confined to the S.E. arm, are set out at Appendix V.

#### *African Fisheries:*

28. Judging by the interest in imported gill net twine, the increased attention being paid to gill netting has been maintained, at least in the Southern Province.

29. Unfortunately, most of the more progressive fishermen who had hopes of establishing their fishing on business lines, have run into difficulties, principally caused by their fellow Africans. It is apparent that much patience and propaganda will be necessary before the really commercial African fishery appears, which is the pre-requisite of rapid progress.

30. Nevertheless some signs of a coming change of attitude appear and the number of fishermen who show active interest in imported twine is an encouraging omen. Some £480 worth was purchased from the Department between the end of the year and October, when new supplies arrived. One Lake Chilwa fisherman, who has been a heavy purchaser, has been supplying fish in ponderable bulk and with some approach to regularity to the Zomba African Hospital. It is hoped that others will follow his example.

31. Data for the African fishery are set out at Appendix VI.

#### *Fish Trade:*

32. Unfortunately, the rise in catch of the non-African firms has not been accompanied by an easier trading situation, because the increase coincided with marked changes in the buoyancy of the tea and tobacco industries, hitherto the major bulk purchasers.

33. Price control was removed half way through the year to allow of a more natural relation between prices of fresh and cured fish, so that there should be more of the latter available for distribution to the bulk purchasers. In the event, however, it was found that the bulk purchasers had more or less faded out of the market. Admittedly the fishing concerns offered their cured product at materially increased prices, but Departmental enquires strongly suggested that they would not have been able to dispose of much cured fish in bulk, even had they not raised their prices beyond the 1950 controlled figure.

34. In this emergency the producers endeavoured to secure permission to export to the higher priced market in Southern Rhodesia. They did not, however, produce facts and figures in support of their contention that a lower price would be uneconomic for them, in spite of repeated Departmental suggestions that they should do so. Permission to export was refused.

35. It is, of course, obvious that the real requirements of two and a half million people far exceed two thousand tons per annum.

36. Meanwhile, the market for fresh fish continued fairly good, so curing was again restricted in favour of marketing fresh. Unfortunately, even in this market the price which the African public appeared willing to pay was not high enough to cover the elaborate arrangement of freezing plant, refrigerated vans, etc., which proper carriage of such large quantities of fresh fish over long distances really demanded. In consequence fish was carried fresh without any such precautions against spoilage. There was much wastage and much was purchased on the markets in a questionable state, though the African purchaser apparently saw no grounds for complaint in its condition.

37. The fact of the matter appears to be that the fishery is in a rather awkward stage of development. There is too much fish in the Southern Province to make the marketing of it merely a matter of disposing of a small quantity of a luxury product at extravagant prices to a favoured few, but the



position is not yet reached when the general public is so used to fish as to regard it as a normal essential of everyday diet. The public is therefore very slow to accept price rises in respect of fish, which they would, and indeed have, accepted in the case of articles which they regard as essential. Until this situation alters handling methods for all but a very small proportion of the catch are likely to remain crude.

38. The price question also affected the African fishery to some extent, as a number of Lake-shore Native Authorities continued to endeavour to hold down the price of fish, though little is done concerning other commodities. Admittedly in many cases fishermen successfully ignore their orders, but so far as they are obeyed they tend to prevent Lake-shore dwellers taking properly organized fishing too seriously and to force fish away from the Lake-shore.

39. In the main the African consumer is not receiving the benefit of these attempts to keep down prices on the Lake-shore, for the retail market price of cured fish is still comparatively high up-country and the person who really reaps the benefit is the middle man.

40. The Native Authority trading scheme at Port Herald, forecast in the 1951 Report, was an attempt to counter this tendency. It was at first successful and though eventually it became uneconomic and had to be closed down, indications were that it would have been fully successful had not the most unusual water levels, following the floods in the early part of the year, completely prevented the prosecution of certain fishing methods in the second half. Since these particular methods usually provide the bulk of the catch at this period, the quantity of fish available for purchase fell below that required to support a proper organization and there was no alternative but to abandon the attempt.

41. Nevertheless a great deal of valuable information was collected and it is considered that another attempt in a more normal year would stand a good chance of success.

#### *Experimental and Development Work:*

42. The sale of imported gear to Africans and the building of boats for sale to Africans continued, five boats being built at Kota-Kota and one at Fort Johnston. Interest in the Central Province is stronger than in the South but seems to be concerned with rather larger craft than are necessary for fishing or within the scope of other than a proper shipwright. It seems that the African views them more as a means for longshore trading than as fishing craft. Nevertheless, their use and advantages as fishing craft have not yet been adequately demonstrated and in any case the adoption of plank boats for one purpose will probably lead eventually to their adoption for another.

43. The two carpenters who were trained under the programme left the Department in October to start their own building business, so the thin end of the wedge may have been inserted.

44. A collection has been made of local roots and bark useful for tanning. This has interested fishermen who have been purchasing the white imported twine and a few have tanned their nets.

45. A successful attempt was made to establish the Ramie fibre plant (*Boehmeria nivea*) at the Fisheries station but it was difficult to keep it alive through the dry season. It seems doubtful if it is hardy enough to replace the closely similar plant already in use by the fishermen.

46. A series of large traps, constructed of poles and chicken wire, on a model suggested by the Fisheries Adviser to the Secretary of State, were tried out on a limited scale. Results were not encouraging in the particular situation where they were tried. The unbaited traps caught nothing, but traps baited with maize flour paste caught a few of the *Synodontis* which are commonly caught in reed basket traps set in similar situations.

47. Experimental and developmental work in connection with Lake fisheries continued to be handicapped by the lack of a launch and a meagre allowance for travelling.

48. Some moves towards experiments in fish farming were made during the year. In addition to his work with trout the Trout Warden at Nchenachena nearly completed a half-acre pond, all that finances would permit, for the experimental culture of Tilapia. The terrain would allow of larger ponds being erected lower down the valley when funds can be secured. A "seepage" pond was also constructed on the perennially marshy land fringing the Lake-shore in the vicinity of the Fisheries station and this was stocked with two species of Tilapia in March. The pond was, however, located at some distance from the Fisheries station and was not closely enough watched. Probably, through the depredations of fish-eating birds, no fish were found surviving when the pond was netted in June.

49. The main hopes of fish farming were, however, placed in an agreement with Booker Bros. who were experimenting in sugar cane production in the Lower River area. Since they intended to irrigate and were concerned to secure supplies of food for labour they expressed interest in fish farming and undertook to construct a pair of fair sized ponds at their own expense, for experimental purposes. These were to be stocked and managed by the Department, the sugar estate staff being responsible for day to day care and supervision. It was hoped that this arrangement would both serve the sugar interests and provide basic data on local species, but it fell through when the sugar project itself was abandoned in December. An experiment on similar lines is to be made in conjunction with Agricultural Department irrigation work at Makanga.

50. A useful forerunner to fish farming, in the upland areas of the North, was the stocking of the Luwawa and Chamakala dams in Mzimba and Kasungu Districts.

51. Consignments of fish from Kasamba lagoon, Kota-Kota, were carried to these dams in August. The fish chosen were three species of Tilapia, as forage fish, one being a weed grazer which should help mosquito control, a small, partly insectivorous partly carnivorous, Haplochromid and a predator to help the achievement of a natural balance and provide a certain amount of sport.

52. A total of 173 Tilapia, 20 Haplochromids and 26 of the predator, "*Sungwa*", were placed in the Luwawa dam and 34 Tilapia, 2 Haplochromids and 19 predators in Chamakala.

53. Reports from the Trout Warden suggest that the Tilapia have successfully established themselves in the Luwawa dam but which species is not yet known. Successful stocking of this dam is of considerable importance, as although its own production rates are not likely to be high, it would form a very useful source of stock for controlled ponds. These could be established in the vicinity and elsewhere in the upland areas.

#### *Trout Fishery:*

54. The hatchery at Nchenachena was completed during the year and a new consignment of ova, kindly supplied by the Kenya Game Department, was successfully reared. Most unfortunately there was very heavy mortality of ova en route, owing to delay in air transport between Blantyre and the North, but some 4,400 fingerlings were successfully reared.

55. Four thousand half-grown fish from 1951 hatchings were distributed without loss at various dates from April to July. One thousand were placed in the Lunyangwa, 1,500 in the Chelinda or Southern Rumpi and 1,500 in the Northern Rumpi. A few were also placed in the Kaulime pool on the Nyika plateau and 37 were distributed in the Luwawa dam.

56. Inspections of the Lunyangwa, Northern Rumpi and Chelinda at the close of the year, showed very satisfactory growth in the two former. Chelinda fish are not so forward. Some fish in the Northern Rumpi had reached 13 ins. just after the turn of the year, having been put in at about 5 ins. in July. It is hoped to open some or all of these streams to fishing during 1954.

57. In the Southern Province work on improvement of the Zomba plateau streams continued and the weir building programme was completed. In an effort to improve the character of the stream, as regards productivity, the experiment of liming the water was tried. Late in the year some five tons of limestone were distributed over a stretch of about a hundred yards above and below Hatchery bridge, being built into weirs, deposited as deflector groins, etc. It is not, of course, suggested that this can have any widespread effect over the stream as a whole, but it was thought possible that a local effect might be produced. Water samples taken about a month after the deposition of the stone did show a slight rise in the alkalinity at the site of the experiment, but as there was also a rise in that of the unlimed area immediately above, no conclusions can be drawn. A series of comparative samples is clearly necessary and this is being collected.

58. Fishing on the Zomba stream is stated to have improved slightly over the past two years but real data are too scarce to form proper conclusions. Certainly some sizeable fish have been caught since the programme of weir building and vegetation clearance really got under way and 2 lb. fish were killed during the season.

59. Fish on the Mlanje plateau, more particularly in the Malembe and Chapeluka streams, became mysteriously scarce during the year. A party fishing at Easter could find virtually none in the streams until the lip of the plateau was passed and then only a very few. Inspection by the Director in June showed about 30 fish in the Chapeluka above the road bridge and 10 in the Malembe, some in both streams being of respectable size. This was better than had been reported, but very far short of the numbers present a comparatively few months before. The stock in the Lichenya appears healthy and satisfactory enough.

60. It is believed either that there has been some pollution of the Chambe waters, in connection with the timber extraction operations and saw mill on the ridge between the streams, or that there has been poisoning or trapping on the stream. In this latter connection it must be noted that a comparatively large labour force has been stationed on the plateau in the immediate vicinity of the stream.

61. In the endeavour to prevent further interference the two Trout Guards have been brought up to live on the plateau instead of at the Forestry depot below, and have been instructed to redouble their vigilance. The stream is also to be closed to fishing in 1953.

62. A total of 42 licences were taken out for the 1952-53 season, value £36.

#### D. TSETSE CONTROL

63. The survey of tsetse distribution proceeded throughout the year, but at a slightly reduced rate owing to the ill health, followed by resignation, of one of the four Survey Officers.

64. In the Southern Province the survey of the Central Shire Valley, from Matope bridge to Fort Johnston, has been completed, together with that of the western side of Cape Maclear peninsula and an extensive area stretching eastward from Fort Johnston to the international border. The survey of the comparatively small portion of Fort Johnston District now remaining will finish the general survey of the Southern Province belts.

65. The survey has shown that *G. morsitans* is present over most of the floor of the central and upper portions of the Shire Valley. The fly is still dense in parts of Fort Johnston District, but is rather sparsely distributed elsewhere in these sections of the valley.

66. In the Central Province the Lake-shore and foothill areas of Dowa District, the Dedza Lake-shore and the extreme southern part of Kota-Kota Lake-shore, were surveyed during the year. In this Province the northern third of Kota-Kota Lake-shore, the Bwanje valley and the Kasungu Fort-Manning border remain to be surveyed.

67. The survey of the southern portion of Kota-Kota District and the Dowa Lake-shore and foothills showed a virtual disappearance of fly from these areas, which were heavily infested as recently as 1948. The same is generally true of Dedza Lake-shore, though in this case a few pockets of heavy infestation still remain. The reason for this marked recession, which to some extent is also visible in

the Southern Province, cannot be stated with certainty, but it seems probable that migration or diminution of game, as a result of the 1949 drought and ever-increasing shooting, is largely responsible. A depression in the population cycle is also possible but it is to be noted that tsetse are still abundant in Northern Kota-Kota and Chikwawa, where game is still fairly plentiful.

68. The attack on the *G. brevipalpis* belt in the Karonga foothills continued, but with rather indeterminate results. After an initial drop, following the start of work in 1950, fly density has not obviously declined much further.

69. Efforts in 1952 were, in the beginning, concentrated on an attempt to control regeneration by systematic reslashing of the new growth. They failed, in that there was no perceptible lessening of regenerative force, but nevertheless a large portion of the area was held at a single canopy of clean-boled trees for considerable periods. In spite of this, flies still persisted, although in small numbers.

70. It became apparent, in fact, that although the habitat most favoured by *G. brevipalpis* is double canopy vegetation, this fly can, at least in this high rainfall area, persist with the protection of a single canopy only, particularly in the shelter of the deep gullies. During the latter part of the year, therefore, both ground thicket and top canopy were attacked, instead of only the former as was originally the case. Results of the more drastic system were encouraging on the individual sites where it was tried, but an overall effect is not yet visible.

71. Appendix VII, Table I, shows the data of fly caught during 1952 patrols while Table II shows comparative figures for the last three years. The sharp rise in fly density at Katumbi's burial grove, where no clearance has yet been made, appears to be the result of an influx of fly from habitats in the vicinity which have been impaired by clearing operations. The possibilities of the use of insecticide for this area are being investigated.

72. Human trypanosomiasis appeared in Chikwawa District for the first time in many years. The first case was reported in June, 1951, and by October, 1952, a total of ten cases had been diagnosed. The Portuguese authorities state that a further three Nyasaland Africans were admitted to Portuguese hospitals across the border.

73. The area concerned is that which lies between the right bank of the Mwanza River and the international boundary, and, broadly speaking, consists of the poor shale soils of the extensive Sumbu area at the headwaters of the Mkombedzi wa Fidia and the comparatively narrow strip of fertile alluvial plain along the banks of the Mwanza River. The population is generally sparse and, in the Sumbu area more particularly, the poverty of the soil prevents concentration of either cultivation or habitation. The picture is of small hamlets and small individual gardens isolated in the surrounding bush. There is a heavy tsetse population all over the area and the very scattered settlement in the Sumbu section makes the man-fly contact unusually intimate. During the dry season there is a considerable traffic between the Mwanza villages and the Sumbu section and in general, conditions appear favourable for the development of a considerable epidemic.

74. Reclamation of the Sumbu section, at present the main focus of infection, seems as difficult as it would certainly be uneconomic. The belt here is extensive, directly continuous with other areas in Portuguese territory, and the land appears to have little or no economic potential.

75. The ideal long term remedy would therefore appear to be to move the scattered, unproductive, population from the Sumbu section and concentrate all on the Mwanza plain. This would at once produce a sufficient concentration of settlement to have a decisive influence on the environment, thus evicting the fly from this portion of the belt, and at the same time lead to the development of the economic possibilities of the alluvial plain.

76. Investigations into the practicability of this step are proceeding and, in the meantime, increased crop protection is being given to the Mwanza plain with the object of encouraging voluntary settlement.

77. The decontamination posts on the main traffic routes were maintained during the year. No flies were caught at Chamatwa post on the Namwera-Domasi Road during 1951 and this post was closed early in 1952. A new post was opened at Dennis village on the newly opened Chingali-Zomba Road, to control traffic coming from the resettlement area in the Shire Valley. This post also caught very few fly and was extremely difficult to supervise and is also to be closed down.

78. Table I of Appendix VIII shows the traffic and catch of fly at the various posts in 1952 and Table II shows the total catch over the last four years. It illustrates very clearly the drop in density which is discussed at paragraph 66 above.

H. J. H. BORLEY  
Director  
Game, Fish and Tsetse Control

APPENDIX I

STAFF AS AT 31st DECEMBER, 1952

Director .. .. .	H. J. H. BORLEY, M.A.
Tsetse Entomologist .. .. .	B. L. MITCHELL, B.SC., A.R.C.S., C.M.Z.S.
Fisheries Officer .. .. .	A. D. SANSON, B.SC.
Game Control Officers .. .. .	E. T. LLEWELLYN G. D. MULDOON O. J. CAREY
Trout Warden .. .. .	A. V. GIFFKINS
Tsetse Survey Officers .. .. .	I. J. LEWIS, B.SC. P. GRAHAM G. BEAUCHAMP
Tsetse Survey Botanist .. .. .	B. STEELE, B.SC., PH.D.

APPENDIX II

CROP PROTECTION SCHEME

TABLE OF ANIMALS KILLED AND STAFF EMPLOYED 1st JANUARY-31st DECEMBER, 1952

	Totals 1951	Northern Province	Central Province	Southern Province	Totals
Average No. of armed hunters per month .. .. .	49	7	23	11	41
Average No. of netters per month .. .. .	18	—	6	4	10
Average No. of poisoners .. .. .	—	—	—	1	1
Average total men per month .. .. .	<u>67</u>	<u>7</u>	<u>29</u>	<u>16</u>	<u>52</u>
ANIMALS KILLED:					
Elephant .. .. .	56	15	67	43	125
Hippo .. .. .	105	4	23	6	33
Buffalo .. .. .	45	1	5	—	6
Water buck .. .. .	18	2	2	—	4
Roan Eland, Kudu .. .. .	32	4	4	5	13
Other buck .. .. .	55	35	22	1	58
Baboon:					
Shot .. .. .	17,476	665	2,474	3,114	6,253
Netted .. .. .	995	—	978	351	1,329
Poisoned .. .. .	—	—	—	195	195
	18,471				7,777
Pig:					
Shot .. .. .	177	73	7	70	150
Netted .. .. .	7	—	—	—	—
Poisoned .. .. .	—	—	—	—	—
Vermin killed for bounty by private effort .. .. .	4,658	2,969	2,389	53	5,411
Carnivora .. .. .	83	12	19	33	64
Round per beast .. .. .	—	?	2.1	1.8	—
Beasts killed per man employed	346	116	124	238	158

APPENDIX III

REVENUE ACCRUING FROM CROP PROTECTION ACTIVITIES DURING 1952

Value of ivory .. .. .	£1,960
Value of meat sold .. .. .	£231
Value of meat passed to district headquarters for hospitals, etc. .. .. .	£69

APPENDIX IV

GAME LICENCES ISSUED DURING 1952

Type	No. Issued	Value
Residents .. .. .	1,709	£1,709
Protectorate full .. .. .	53	265
„ Temporary .. .. .	—	—
Visitors full .. .. .	7	105
„ Temporary .. .. .	1	5
	<u>1,770</u>	<u>£2,084</u>



APPENDIX V

NON-AFRICAN FISHERY

TABLE I. TOTAL HAULS OF EACH TYPE OF NET PER ANNUM

Type of Net	1949	1950	1951	1952
Ring Net. S.E. Arm .. ..	1,599	2,175	4,264	3,926
„ „ Malombe .. ..	240	—	—	—
Seine Net. S.E. Arm .. ..	180	36	—	—
Gill Net. S.E. Arm .. ..	258	609	344	560
„ „ Malombe .. ..	58	—	—	—

TABLE II. AVERAGE CATCH PER SINGLE HAUL OF NET BY ONE FIRM THROUGHOUT THE YEAR  
(Numbers Represent Dozens)

Type of Net.	1949	1950	1951	1952
Ring Net S.E. Arm Tilapia .. ..	50	49	44	66
„ „ „ Labeo .. ..	—	—	—	0.3
„ „ „ Catfish .. ..	—	—	—	—
Gill Net S.E. Arm Tilapia .. ..	28	18	13	2
„ „ „ Labeo .. ..	69	56	86	40
„ „ „ Catfish .. ..	16	32	33	6

TABLE III. TOTAL CATCHES OF MORE IMPORTANT SPECIES IN S.E. ARM.  
(Numbers Represent Dozens. Weight Estimates as Short Tons)

Year	Tilapia (Adult)	Tilapia (Immature)	Labeo	Clarias	Other	Wt.
1949 .. ..	63,494	823	12,469	3,851	715	..
1950 .. ..	97,880	1,423	18,853	11,149	826	1,137
1951 .. ..	131,247	—	15,557	6,423	848	1,278
1952 .. ..	214,854	—	25,418	4,659	36	1,978

TABLE IV. LANDINGS PER MONTH (Short Tons), 1952

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
187	283	233	237	267	172	84	73	97	183	105	57

TABLE V. NUMBER OF NETS REGISTERED BY NON-AFRICAN FIRMS

	Number	Average Length	Average Depth	Fees paid
Ring Net .. ..	4	400 yds.	120 ft.	£40
Shore Seine .. ..	—	—	—	—
Gill Net .. ..	7,000 yds.	—	16 ft.	£35

APPENDIX VI

AFRICAN FISHERY

TABLE I. TOTAL NUMBER OF HAULS OF MAIN TYPES OF NET OBSERVED AT RECORDING STATIONS

	Large Meshed Seines			Small Meshed Seine			Gill Nets		
	1950	1951	1952	1950	1951	1952	1950	1951	1952
Malindi .. ..	24	—	—	3,752	6,586	3,323	56	—	12
Mateweri .. ..	168	218	199	168	44	33	175	512	242
Shire River .. ..	613	1,234	1,476	78	—	—	—	—	—
Mpemba .. ..	85	135	124	397	161	267	49	226	321
Monkey Bay .. ..	139	84	35	67	58	72	52	9	10
Kota-Kota .. ..	377	34	48	91	6	11	1,230	322	841
		(5 months)			(5 months)			(5 months)	
Salima .. ..	200	491	625	170	400	170	—	—	3
		(5 months)			(5 months)				
Domira Bay .. ..	568	298	153	—	10	2	575	736	574
		(11 months)			(11 months)			(11 months)	
Chia Lagoon .. ..	Not observed		772	Not observed		—	Not observed		31



TABLE II. AVERAGE CATCH PER SINGLE HAUL OF NET AT RECORDING STATIONS.  
(Figures Represent Actual Numbers of Fish)

A. Small Meshed Shore Seines.										
Period and Station	Tilapia (Adult)	Tilapia* (Immature)	Labeo	Clarias	Haplochromids*					
MALINDI										
Jan.-Dec. 1950 ..	1.6	5	.9	.5	1,045					
Jan.-Dec. 1951 ..	.3	115	.09	.22	596					
Jan.-Dec. 1952 ..	.3	—	.44	.17	570					
MATEWERI										
Jan.-Dec. 1950 ..	2.7	45	.3	.4	815					
Jan.-Dec. 1951 ..	2.5	10	—	.4	15					
Jan.-Dec. 1952 ..	1.6	460	.3	.3	1,250					
MPEMBA										
Jan.-Dec. 1950 ..	.3	2.5	—	.1	400					
Jan.-Dec. 1951 ..	.5	20	—	.17	355					
Jan.-Dec. 1952 ..	.4	10	.03	.1	220					
MONKEY BAY										
Jan.-Dec. 1950 ..	17	1,350	32	.5	835					
Jan.-Dec. 1951 ..	10.97	25	2.1	3.6	3,760					
Jan.-Dec. 1952 ..	23.74	30	7.17	1.56	840					
KOTA-KOTA										
Jan.-Dec. 1950 ..	23	5	8.7	7	135					
Jan.-March and Nov.-Dec. 1951 ..	10.7	—	8.0	6.7	135					
Jan.-Dec. 1952 ..	40	—	4.73	4.36	—					
SALIMA										
Jan.-Dec. 1950 ..	42.6	—	5.6	2.8	740					
Aug.-Dec. 1951 ..	14.8	—	2.29	2.04	355					
Jan.-Dec. 1952 ..	23.28	—	4.73	2.67	80					
DOMIRA BAY										
Jan.-Nov. 1951 ..	47.8	—	111.6	2.8	—					
Jan.-Dec. 1952 ..	6.5	—	1.5	2.5	—					
B. Large Meshed Shore Seines.										
Period and Station	Tilapia (Adult)	Tilapia (Immature)	Labeo	Clarias	Haplochromids					
MATEWERI										
Jan.-Dec. 1950 ..	51	—	9	.3	—					
Jan.-Dec. 1951 ..	64.5	—	11.9	.9	—					
Jan.-Dec. 1952 ..	102.19	—	1.6	1.4	—					
MPEMBA										
Jan.-Dec. 1950 ..	139	55	26	3.0	—					
Jan.-Dec. 1951 ..	82.42	—	7.1	2.7	—					
Jan.-Dec. 1952 ..	40.93	—	7.9	2.15	—					
SHIRE RIVER										
Jan.-Dec. 1950 ..	25	—	2.6	1.5	—					
Jan.-Dec. 1951 ..	24.3	—	2.4	.74	—					
Jan.-Dec. 1952 ..	27.53	—	2.84	.45	—					
MONKEY BAY										
Jan.-Dec. 1950 ..	33	20	4	.8	10					
Jan.-Dec. 1951 ..	100	25	10.4	5.07	—					
Jan.-Dec. 1952 ..	38	15	13.89	.63	—					
KOTA-KOTA										
Jan.-Dec. 1950 ..	76	—	48	14	—					
Jan.-March and Nov.-Dec. 1951 ..	116	—	109.32	21	—					
Jan.-Dec. 1952 ..	69.17	—	91.9	9.44	—					
SALIMA										
Jan.-Nov. 1950 ..	133	—	6	4	—					
Aug.-Dec. 1951 ..	43	—	5	.8	—					
Jan.-Dec. 1952 ..	59.58	—	8.07	2.85	—					
DOMIRA BAY										
Jan.-Dec. 1950 ..	194	—	41	9	—					
Jan.-Nov. 1951 ..	171	—	53	8.2	—					
Jan.-Dec. 1952 ..	159	55	39.76	3.67	—					
CHIA LAGGON										
Jan.-Dec. 1952 ..	25	—	1.3	8	—					

C. Open Water Seine.

Period and Station	Tilapia (Adult)	Tilapia (Immature)	Labeo	Clarias	Haplochromids
MPEMBA					
Jan.-Dec. 1950 ..	.1 ..	— ..	— ..	.1 ..	185 ..
Jan.-Dec. 1951 ..	.6 ..	— ..	— ..	.8 ..	1,020 ..
Jan.-Dec. 1952 ..	1 ..	— ..	— ..	.4 ..	515 ..
CHIA LAGOON					
Jan.-Dec. 1952 ..	11.5 ..	— ..	1.2 ..	.2 ..	— ..

TABLE III. SUMMARY OF CATCHES BY ALL METHODS OBSERVED AT RECORDING STATIONS (Actual Numbers of Fish)

	Tilapia (Adult)	Tilapia (Immature)	Labeo	Clarias	Haplochromids	Other
Malindi ..	1,045 ..	— ..	1,573 ..	624 ..	1,911,500 ..	4,856 ..
Mateweri ..	21,212 ..	23,565 ..	7,286 ..	1,011 ..	288,630 ..	4,669 ..
Shire River ..	51,054 ..	11,515 ..	4,186 ..	4,230 ..	46,500 ..	11,450 ..
Mpemba ..	6,469 ..	550 ..	4,049 ..	796 ..	380,650 ..	4,727 ..
Monkey Bay ..	3,059 ..	2,600 ..	1,344 ..	4,013 ..	61,059 ..	10,387 ..
Kota-Kota ..	5,983 ..	— ..	23,304 ..	8,723 ..	— ..	13,850 ..
Salima ..	43,880 ..	52,575 ..	5,900 ..	2,394 ..	13,875 ..	10,475 ..
Domira Bay ..	24,667 ..	3,250 ..	11,919 ..	2,537 ..	— ..	15,494 ..
Chia Lagoon ..	34,654 ..	— ..	1,753 ..	5,858 ..	— ..	4,091 ..

APPENDIX VII

KARONGA RECLAMATION SCHEME, 1952

TABLE I. FLIES PER SINGLE PATROL

Month	Ngerenge	Katumbi	Yembe South	Yembe North	Mweningolongo	Chisi
January ..	Nil ..	3.8 ..	1.2 ..	2.4 ..	4.4 ..	2.5 ..
February ..	Nil ..	3.4 ..	1.6 ..	3.0 ..	3.5 ..	2.1 ..
March ..	Nil ..	3.4 ..	1.9 ..	3.2 ..	4.7 ..	2.5 ..
April ..	Nil ..	3.5 ..	2.9 ..	3.3 ..	3.8 ..	2.7 ..
May ..	Nil ..	2.4 ..	2.9 ..	3.4 ..	3.0 ..	2.8 ..
June ..	0.5 ..	3.0 ..	2.5 ..	3.4 ..	4.1 ..	2.9 ..
July ..	0.3 ..	2.4 ..	2.8 ..	4.4 ..	3.1 ..	2.0 ..
August ..	0.4 ..	2.9 ..	3.1 ..	4.9 ..	4.0 ..	1.6 ..
September ..	0.1 ..	3.8 ..	2.2 ..	3.7 ..	2.3 ..	0.9 ..
October ..	0.1 ..	3.2 ..	2.0 ..	2.4 ..	2.5 ..	0.3 ..
November ..	0.15 ..	2.3 ..	1.4 ..	2.9 ..	2.2 ..	1.1 ..
December ..	0.15 ..	2.4 ..	1.6 ..	3.6 ..	2.4 ..	1.0 ..
ANNUAL MEAN	0.14	3.04	2.17	3.38	3.33	1.87

TABLE II. TABLE TO SHOW THE ANNUAL MEAN NUMBER OF *G. brevipalpis* TAKEN PER PATROL

Station	1950	1951	1952	Remarks
Chief Katumbi's burial grove	2.0 ..	8.0 ..	8.0 ..	Uncleared in reclamation area Operations area in main fly belt
Other fly rounds in Katumbi	2.6 ..	2.5 ..	1.9 ..	
Yembe South ..	5.0 ..	2.1 ..	2.2 ..	
Yembe North ..	5.4 ..	3.4 ..	3.4 ..	Control area in main fly belt. No clearance
Mweningolongo ..	— ..	5.7 ..	3.4 ..	
Chisi ..	— ..	2.0 ..	1.9 ..	

APPENDIX VIII  
 NYASALAND DE-FLYING POSTS

TABLE I. SUMMARY OF ALL STATIONS FOR 1952

Post	Position	Number Motor Vehicles	Flies Caught	Number Cycles	Flies Caught	Number Pedestrians	Flies Caught	Total Flies
Kota-Kota	Outskirts Kota-Kota Township (N)	1,541	6	6,847	35	33,680	6	47
Chota . .	Outskirts Kota-Kota Township (S)	—	—	32,628	9	96,332	3	12
Mbobo	Approach to C.P. Highlands. Kota-Kota-Lilongwe Rd.	807	10	2,915	13	23,880	3	26
Mvera	Approach to C.P. Highlands. Salima-Lilongwe Rd.	5,410	7	4,625	50	5,927	9	66
Fort Johnston	Outskirts Ft. Johnston Township. East of Ferry crossing	1,618	57	67,440	2,548	104,590	4,957	7,557
Kasupe	Approach to Zomba Highlands. Liwonde-Zomba Rd.	3,586	3	21,107	60	23,518	21	84
Dennis	Approach to Zomba Highlands. From Chingali in Rift Valley	224	—	10,126	1	35,387	—	1
Lirangwe	Approach to Shire Highlands. From Shire Valley. Matope Rd.	4,628	5	8,818	34	9,874	3	42

TABLE II. LONG TERM RECORDS FROM DE-FLYING POSTS. TOTAL FLIES

Station	1949	1950	1951	1952
Kota-Kota	211	96	113	47
Chota . .	273	69	34	12
Mbobo	125	110	179	26
Mvera	2,547	735	290	66
Fort Johnston	12,628	14,351	14,521	7,557
Lirangwe	49	21	93	42