G.F.T.C.—2069—(S.M.P. (D) 15978) (80)

NYASALAND PROTECTORATE

Annual Report of the Department of Game, Fish and Tsetse Control for the year ended 31st December, 1950

A. STAFF AND GENERAL

1. Staff difficulties in the Game Control side of the Department continued to be severe and the year saw further changes in this section. The departure of Mr. Bayley in March left the Northern Province without a Game Control Officer and no replacement had been found by the end of the year. The Department gained, however, by the transfer of Mr. Muldoon from the Agricultural Department to the Central Province Game Control establishment. Both this officer and Mr. Llewellyn in the Southern Province were seconded for famine relief for most of the first quarter.

2. The Fisheries Staff was increased by the recruitment of Mr. Dunlop as Fish Ranger, and, at the close of the year by Mr. Gifkins as Trout Warden. Under the provisions of the Colonial Development and Welfare Scheme for a Protectorate-wide Tsetse Survey, Messrs. Harington, Lewis and Graham were recruited as Tsetse Survey Officers during March and Mr. Beauchamp joined them in December.

3. Both Mr. Sanson, Fisheries Officer, and Mr. Borley, Director, proceeded on leave during 1950, Mr. Mitchell, Tsetse Entomologist, acting as Head of Department in the absence of the Director.

4. The staff position as at 31st December, 1950, is set forth in Appendix I.

B. GAME

5. The main emphasis of work during the year has remained on crop protection. Staff difficulties and the secondment of officers to famine relief, interfered with organization and did not permit the Game Control Section to proceed beyond its priority task.

6. In the Northern Province little really systematic work has been possible in default of a full-time European officer from March onwards. Prior to the departure of the Game Control Officer, some good work was done against baboons in Chinteche District, and the Tsetse Ranger, Karonga, has given useful part-time supervision to a small team in that District. The main team in Mzimba, supervised by the District Officers in what little time they could spare from Administrative duties, has not been so successful and it is doubtful if it has been of much value except from a political aspect. It was retained in deference to the wishes of the Provincial Commissioner and because it was not expected that it would take so long to find a replacement for the Game Control Officer.

7. In the Central Province a much more systematic effort has been possible. At the instance of the Director, with the assent of the Provincial Natural Resources Board and active direction of the Provincial Commissioner, a system of priorities has been worked out and rigidly adhered to, especially in regard to Kota Kota and Dowa Districts. Here a policy of undeviating effort on the productive Lake-shore plains and the ignoring of the unfertile hills and scarp country has resulted in a decisive degree of protection being accorded to these important areas. The plateau section of the Central Province was without a Game Control Officer till July and the country does not so easily lend itself to division for systematic attack, so that the effort here has been rather more diffuse. In addition to the efforts of the regular staff, Mr. Mansell Bartlett has given voluntary supervision to a team of poisoners on the Lake-shore of Dedza District and some good results, in point of numbers, have been achieved. In Kota Kota District the baboons, against which poison is chiefly aimed, appear to have become aware of the danger of baits and this method seems no longer to produce results.

8. In the Southern Province the long secondment of the Game Control Officer to famine relief both restricted the intensity of the effort at the time and also made it desirable, on political grounds, that when he was eventually released his team should be moved fairly rapidly round the Province. Useful work was done in several individual areas but they were too small and too scattered to make it probable that any lasting effect has been achieved in any one of them.

9. In the field of crop protection mention should be made of an attempt to stimulate private action against vermin by the payment of bounties. It was intended to apply this system in all three Provinces but the Provincial Development Committee of the Southern Province disallowed the scheme, taking the view that no financial encouragement ought to be necessary for an activity so much in the interests of the general community. The scheme applied in the other two Provinces produced extraordinarily uneven results. In the Northern Province 2,396 head of vermin were destroyed in the Chinteche District and only 152 in the other two Districts while in the Central Province 1,189 head were destroyed in Fort Manning sub-District against 214 head in the rest of the Province.

10. Man-eating carnivora, particularly leopards, figured more largely in the game picture than they commonly do. Four leopards and one lion harried the Kota Kota District at various times during the year and three leopards and one lion the central part of the Southern Province. Three of the man-eaters in the Kota Kota District were dealt with personally by the Game Control Officer and the remainder by the team, while the Southern Province Game Control team accounted for the lion and one of the leopards in that Province. A second leopard was shot by Mr. Usher, Honorary Game Warden, and he made determined efforts to get the third. It was eventually disposed of by Africans using a trap gun.

11. An analysis of African Staff employed, animals destroyed and ammunition expended appears at Appendix II. The proportion of game destroyed, as distinct from the vermin which constitute the more serious marauders, shows a reduction from 1949 figures.

12. Appendix III shows the value of ivory collected in the course of crop protection. Revenue accruing to the Native Development and Welfare Fund from sale of meat was negligible during 1950, most of the little game shot having been used to feed labour employed on the survey of the Kasungu tobacco estates, or handed over to Native Treasuries for sale.

13. Crocodile destruction continued in the Central and Southern Provinces, under the charge of Mr. Jollyman acting in an honorary capacity. Some 284 dead crocodiles were actually found and it is expected that a number of others perished in inaccessable places.

14. Some experiments were made during the year with electric fencing units, one in the Northern and one in the Southern Province. Owing to the preoccupation of the Game Control Staff with famine relief measures during most of the growing season it was not possible for them to undertake the necessary recording in connection with the experiments. Certain officers of the Agricultural Department, who were favourably situated to judge efficacy, kindly undertook to supervise the working of the sets. The Southern Province set arrived rather too late in the year for conclusive results to be obtained but during the time it was in action it certainly served to turn back pig, the only type of marauding game in the particular locality. It seems, however, that the difficulty of obtaining supplies of wire in adequate quantities or at inexpensive rates is likely to limit seriously the application of this method.

15. There is little to report in connection with game conservation for the reasons already stated, but both the Kota Kota and Lengwe Game Reserves were inspected with a view to relignment on more easily recognizable boundaries. Recommendations were made concerning both, entailing a considerable extension of the Kota Kota Reserve. Definite agreement was reached with the Agricultural Department and the Provincial and District Administration with respect to the Lengwe Reserve but the new boundaries of Kota Kota were still under consideration at the end of the year. The new Lengwe boundaries will include nearly all the thicket country favoured by the Nyala, which, curiously enough, lies outside the boundaries of the Reserve as defined in 1934. During the course of Tsetse investigations in the Lower River District, the Tsetse Entomologist discovered another potential Nyala Reserve area, more remote from settlement than the Lengwe and there are good hopes of creating a new sanctuary there. The area also carries a fair population of Rhinoceros and generally should be a considerable asset to the game conservation programme.

C. FISHERY

The State of the Fish Stocks :

16. Considerable data has been, and is being, accumulated for the various important species of fish and it may be said that the pattern of the fishery is being slowly revealed. The main study is directed to the Tilapia fishery, on account of its prime importance, but the other main types of fish are not being neglected.

17. The fishing licences for the 1950–51 season imposed a close season on non-African seine and ring net-fishing in the S.E. arm from 1st November, 1950, to 31st January, 1951, in protection of the overfished Tilapia group. A similar close season was imposed for the 1948–49 season but had to be abandoned for the 1949–50 season under stress of famine.

18. Data from the S.E. arm suggest a slight recovery in the fishery for the open water species of Tilapia since the 1948 close season. The fact that the non-African concerns made very little use of shore seine nets is indicative of the continuing shortage in the inshore stocks but it should be noted that African shore seine catches, mostly dependent on these stocks, show a slight improvement. Examination of the data of the catches of a ring net, fished consistently by one non-African firm in the S.E. arm since 1944, show a fall in Tilapia catch per single hand of net from 46 dozen in 1947 to 30 dozen in 1948. The imposition of a close season from 1st October, 1948, to 31st January, 1949, was followed by a rise in catch per unit effort to 50 dozen for 1949 though the number of casts was equal to that for 1948, and the total catch consequently bigger. Addition of average figures for October, November and December to the 1948 totals would not have brought the total catch for that year up to the 1949 figure and would have depressed the catch per unit effort.

19. Catch per unit effort for 1950 was 49 dozen with a total effort rather higher than 1949, there being an increase in the total catch for 1950 but not quite in ratio with the rise in effort. This suggests that the total effort now verges on the maximum which the stocks will stand and that the farther increase in Tilapia fishing will not only fail to bring comparable reward but will very soon result in lower total catches.

The Non-African fisheries :

20. Tables in Appendix IV give statistics of the non-African fisheries. As before, these are based on returns submitted by the non-African firms themselves, verified as far as possible by the personal observations of the Fisheries Officer. The estimates of weight of fish landed are not properly comparable with those noted in previous years as a new basis of computation has been used in them. This, it is considered, gives a more realistic result than the old basis which made no allowance for the difference in average weight of different species. The data for average catch are also presented in a manner slightly different from that in the 1949 Report. For 1950 the figure represents the average success of all hauls in the year taken together, instead of the mean of the monthly average.

21. The new firm which made its appearance in 1949 in the S.E. arm, was forced, by a catastrophic fall in vitamin oil prices, to abandon its concentration on long lining for the catfish. These fish have a high oil content but are second-grade for table purposes and the firm in question has had to undertake more general fishing. On the other hand, perhaps partly owing to the close season on seine and ring net-fishing, the general use of gill nets in the non-African fishery has increased and this has more than offset the decline in long lining by one firm. Thus species other than Tilapia, catfish among them, make up a much larger proportions of the total catch than before.

22. Four non-African firms were in possession of fishing licences at the close of 1950 but only three were actually fishing.

The African Fishery :

23. Records of African catches are summarized at Appendix V. They do not cover the total effort but only that actually observed and merely give an indication of the direction and degree of success of the effort. Probably total African catchs of all species remained above that of non-African firms.

24. The data show an improved Tilapia catch per single haul of seine net since 1949 in those hauls which were observed by the recorders, the total quantity of fish which they saw landed being considerably above that in 1949, though at nearly all stations the number of hauls actually observed was smaller.

25. The actual amount of immature Tilapia taken has unfortunately increased, particularly at Malindi where there is an important fishery for the small Haplochromids necessitating the use of small meshed nets. It is a matter of considerable difficulty to compose restrictions which will protect Tilapia without stultifying the Haplochromis fishery but an attempt will be made for the 1951–52 Season. The increase in total catch of young Tilapia is not actually out of proportion to the general increase of total catch of all species, catches of labeo and catfish having increased to an even greater extent.

26. Gill netting, which is desirable because it throws less emphasis on the Tilapia, showed a welcome increase, partly as a result of twine sales referred to below. Crocodiles continued to be a major menace.

27. Efforts to encourage the development of African fisheries by the bulk buying and resale of better gear were continued and 50 lbs. weight of hand line, 56 lbs. weight of seine twine and 100 lbs. weight of gill net twine were sold in Fort Johnston District and 280 lbs. weight of gill net twine were sold to the Lake Chilwa fishermen. The sale of gear was accompanied by propaganda in favour of a Co-operative Bulk Purchasing Society so that the African might, by his own efforts, tap a source of supply of better gear. There has been little or no response in the direction of co-operative effort but three individual Africans deposited over £100 with Government against personal orders through the Fisheries Officer for specific items of gear and it appears that others are about to follow the lead given. It seems that developments are likely to be individualistic rather than co-operative for some time to come.

Fish Trade :

28. No further information is available regarding the fish requirements of the Territory but on the basis of previously indicated requirements, if not on population figures alone, it can be assumed that requirements exceed supply.

29. The question of export was reviewed by Government with considerable care and it was decided to prohibit all export of fish from the Territory for the time being. A small quantity of fish viscera sent down to South Africa for vitamin oil analysis, formed the only fish export.

30. The African fish trade remains almost entirely in the hands of middlemen operating with bicycle loads, though a few middlemen and some of the fishermen make use of the various transport companies to take their loads to the major markets. No success has followed the efforts of the Department to encourage the fishermen of an area to sell exclusively to one African buyer in the hope of creating a more regular and defined trade and eventually bringing higher prices to the fishermen. A major factor in the failure has been the low prices fixed by Lake-shore Native Foodstuffs Committees. These do not give enough latitude to the individual African buyer to attract a larger proportion of fish by offering a price more in keeping with that pertaining in the hill markets and put him at a disadvantage with respect to the non-African buyer. The latter is bound only by the prices fixed by the Controller of Essential Supplies, which are almost seven times those accepted by the Lake-shore Native Authorities.

Trout Fishing :

31. A total of 42 Trout fishing licences were issued in respect of the Zomba Mountain fishing and six for the Mlanje streams, yielding some £53 in revenue.

32. Stream improvement was continued on the Mlungusi by the erection of further boulder weirs. Those in 1949 stood through the rains tolerably well. There seems to have been some minor improvement in fishing as a result.

33. An attempt was made early in the year to stock one of the Nyika streams in the Northern Province with trout, arrangements being made to fly a small consignment of ova out from the United Kingdom. Unfortunately, at the last moment, B.O.A.C. authorities in England refused to accept the consignment for Chileka, stating, quite incorrectly, that the ground was unusable owing to floods and insisting on sending it by the slower flying-boat route to Cape Maclear. The flying-boat was in any case a day late on schedule with the result that air transport arrangements within the Territory broke down and the ova had to be laid rather hastily in a partly surveyed tributary of the Domasi. Temperature conditions were not so favourable here as on the Nyika and it does not seem that any have successfully hatched.

D. TSETSE CONTROL

34. Defensive action, in the form of maintainance of decontamination posts on the main traffic routes, continued during 1950. Figures of flies caught at these posts are given in Appendix VI.

35. As a result of the erection by the Portuguese authorities of a tsetse control post covering the approach to Zobwe from the Zambesi Valley, the Nyasaland post on the Mwanza border became redundant and was closed down.

36. The experimental post at Chikwawa ferry has also been abandoned, no fly having been caught there since its establishment in 1947.

37. Two new posts were opened during the year, at Kasupe and Chikala on the Liwonde–Zomba and Namweras–Zomba Roads respectively, covering the access routes to the Zomba cattle areas from the tsetse belts in the Shire Valley. The post at Kasupe is equipped with a decontamination shed as most of the fly appears to come by this route, but the post at Chikala is subsidiary and is open air.

38. The decontamination shed at Lirangwe was requisitioned as a food store for Famine Relief during the early part of the year and work was carried on in the open. Shortly after this, an outbreak of cattle trypanosomiasis occurred in a herd living close to the fly shed and another occurred near Blantyre.

39. Experiments in reclamation of tsetse bush were carried out in the *mopane* woodland of the upper Shire Valley and on the Lake-shore of Karonga District.

40. The *mopane* experiment consisted of the clearing of the gallery forest along the watercourses which traverse the woodland, it having been observed that during the dry weather the fly is dependent on the shade there because the rest of the woodland becomes defoliated.

41. The fly belt in the area chosen for the experiment is isolated and approximately 6.12 square miles in extent. Gallery forest was present on four watercourses for a total area of .075 square miles so that a disturbance of only 1–2 per cent. of the total fly infested area was involved. The experiment was not completed till late in the year and it is therefore too early to make a definite statement as to success.

42. It is probable that reasonably close settlement would of itself serve to eliminate tsetse in these lightly infested areas, by disturbance of game and vegetation and the experiment was designed to find a means of protecting the peripheries of such settlement areas.

43. The experiment on the Karonga Lake-shore was designed to check the invasion of the cattle plains by fly infesting the drainage lines leading out of the foothills. Here the technique was to remove all forest undergrowth, especially the evergreen elements, but to leave all clean-boled trees standing, the species concerned, *G. brevipalpis*, being dependent on the shade provided by double tiered vegetation.

44. Operations started early in May beginning at the Kasisi Stream and working northwards. Progress was rapid in the southern, low rainfall, area where the tsetse is present only in comparatively small scattered pockets. In the northern section a convolution of the line of the foothills enclosed a re-entrant of fertile plain about eight square miles in extent. The plain is largely uninhabited and owing to this fact a considerable area of it was under forest and consequently carrying a population of *G. brevipalpis*. This area has been cleared, as has the whole of Yembe Hill immediately bordering the flood plain of the Songwe. A small fly belt in the Mukungwi Valley, south of Mpata, was also eradicated during the year.

45. At the end of the first year's work, therefore, the position was that the bush, essential to fly, had been cut out from all the drainage lines on the hill slopes overlooking the Lake plain for a distance of about 20 miles terminating on the flood plain of the Songwe.

46. If the measures are successful a considerable area of fertile land will have been freed from resident tsetse and a much larger area freed from the occasional invasions of fly which have given rise to heavy incidence of cattle trypanosomiasis in the past.

47. Catches of fly along the edge of the plain have fallen off very markedly as the cutting progressed and though some drop is in any case to be expected during the dry season, there is some indication that the experiment is proving successful. It is, however, still too early to be definite.

48. It is noteworthy that on the Tanganyika side of the Songwe River a severe outbreak of trypanosomiasis has recently occurred with a high mortality rate, so the operations on the Nyasaland side may have been exceptionally timely.

49. The year saw the start of the Protectorate Tsetse Survey under grant from the Colonial Development and Welfare Fund. This is designed to disclose both the limits of the existing fly belts and their constitution and should provide data for action to reduce the belts or decisively limit their extension, as may be desirable on general grounds.

50. Three Survey Officers were recruited in March and after a preliminary course in the bionomics and ecology of the fly in Nyasaland, carried out a trial survey of a portion of the Shire Valley in Zomba and Blantyre Districts. They then visited the Tsetse Research Station at Shinyanga, where Mr. Potts arranged for them a very extensive and helpful programme. We are greatly indebted to the officers of the East African Tsetse and Trypanosomiasis Research and Reclamation Organization for their helpfulness in completing the training of our officers. Mr. Rickman, Tsetse Ranger, also rendered very valuable service in training them in the elements of mapping.

51. The party returned to Nyasaland in October. Two officers were posted to the Southern and one to the Central Province and commenced work in accordance with a list of priorities laid down by the Provincial Commissioners.

52. Areas surveyed by the end of the year included the Rift Valley area on the east side of the Shire River between Matope and Liwonde, the Domasi–Likwenu Valleys in Zomba District and the area east of the Great North Road between the Dwangwa and the Kasungu–Kota Kota Road as far as the border of Kasungu District. Work had also started on a survey of the north bank of the Mwanza in Chikwawa and of the Lower Magomero–Palombe Plain in Zomba and Mlanje Districts.

53. The upland areas of Zomba and the part of northern Mlanje which had been surveyed by the end of the year appeared to be free of tsetse. The survey of the Rift Valley section served to delineated the the main focus of tsetse infestation and suggested methods of dealing with it. The Kasungu District has a history of large scale advances and recessions of tsetse and the result of the survey shows that at the present time tsetse is absent from the area surveyed which it is known to have occupied as recently as 1942. This survey also revealed what would be the probable line of advance from the tsetse areas of the Bua Valley should there be a resurgence of fly, and indicated a likely method of holding this in check.

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

APPENDIX I

STAFF AS AT 31st DECEMBER, 1950

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
	C. C. Lindsay-Smith
Tsetse Rangers	C. H. E. Rickman
	D. G. Arnold
Fish Ranger	H. Dunlop
Trout Warden	A. V. Gifkins
Tsetse Survey Officers	I. J. Lewis, B.Sc.
	P. Graham
	N. H. F. Harington
	G. Beauchamp

APPENDIX II

CROP PROTECTION SCHEME

Table of Animals Killed and Staff Employed 1st Jan.—31st Dec., 1950

	Totals 1949		Northern Province (3)	Central Province		Southern Province (4)	Totals 1950	
				Kota Kota Teams (4)	Hill Area Teams (5)			
Average number of Armed hunters per month ..	51		12	20	10	9	51	
Average number of netters per month	32		—	5	1 (6 m)	3	9	
Average number of poisoners ..	24		—	1	10 (6 m)	—	11	
Average total men per month ..	107		12	26	21	12	71	
Animals Killed :								
Elephant	79		9	10	7	2	28	
Hippo	106		68	22	1	12	103	
Buffalo	63		40	13	—	—	53	
Water Buck	163		9	24	—	—	33	
Roan Eland	187		7	4	34	1	46	
Kudu, Other Buck ..	357		35	4	23	10	72	
Baboon :								
Shot	8,892		1,120	5,705	1,273	3,004	11,102	
Netted	1,969	13,928	—	140	51	—	191	16,626
(1) Poisoned	3,067		—	8	1,909	—	1,917	
(6) Killed on bounty ..	—		2,151	129	1,136	—	3,416	
Pig :								
Shot	469		42	141	11	21	215	
Netted	32	613	—	—	—	—	—	751
Poisoned	112		—	1	—	—	1	
(6) Killed on bounty ..	—		397	2	136	—	535	
Carnivora	79		3	24	7	42	76	
Rounds per beast killed (2)	—		2	1.2	2.4	1.3	—	
Beasts killed per man employed	145		115	239	157	256	191	

(1) Numbers given=those of dead bodies actually found. Probably many others died but were not found.

(2) Totals of beasts killed used in this calculation do not include those poisoned.

(3) Teams without special supervision for ten months of year.

(4) G.C.O. in charge on Famine Relief for first three months. Part-time supervision.

(5) Teams without special supervision for first six months of year.

(6) Numbers deduced from bounties paid out by District Commissioners and Native Authorities.

APPENDIX III

VALUE OF IVORY FROM ELEPHANT SHOT DURING CROP PROTECTION

Northern Province	*Central Province*	*Southern Province*
No returns ..	£679 ..	£18

APPENDIX IV

NON-AFRICAN FISHERY

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

Type of Net	1947	1948	1949	1950
Ring Net. S.E. Arm ..	1,322 ..	1,299 ..	1,599 ..	2,175
,, ,, Malombe ..	— ..	— ..	240 ..	—
Seine Net. S.E. Arm ..	1,898 ..	505 ..	180 ..	36
Gill Net. S.E. Arm ..	557 ..	319 ..	258 ..	609
,, ,, Malombe ..	— ..	— ..	58 ..	—

TABLE II. AVERAGE CATCH PER SINGLE HAUL OF NET BY ONE FIRM THROUGHOUT THE YEAR. (NUMBERS REPRESENT DOZENS)

Type of Net		1947	1948	1949	1950
Ring Net S.E. Arm.	Tilapia ..	46 ..	30 ..	50 ..	49
	Labeo ..	— ..	— ..	— ..	—
	Catfish ..	— ..	— ..	— ..	—
Seine Net S.E. Arm.	Tilapia ..	16 ..	20 ..	Net abandoned	
	Labeo ..	— ..	— ..	— ..	—
	Catfish ..	— ..	— ..	— ..	—
Gill Net S.E. Arm.	Tilapia ..	7 ..	11 ..	28 ..	17
	Labeo ..	32 ..	63 ..	69 ..	56
	Catfish ..	7 ..	15 ..	16 ..	32

TABLE III. TOTAL CATCHES OF MORE IMPORTANT SPECIES S.E. ARM. (NUMBERS REPRESENT DOZENS. WEIGHT ESTIMATED AS SHORT TONS)

Year	*Tilapia (Adult)*	*Tilapia (Immature)*	*Labeo*	*Clarias, etc.*	*Others*	*Estimated Wt.*
1947	84,823	14,892	16,760	4,370	483 (Baskets Utaka)	
1948	58,544	4,969	20,494	5,051	514	
1949 S.E. Arm ..	63,494	823	12,469	3,851	715	
1949 Malombe ..	36,199	—	4,400	2,149	410	
1950	97,880	1,423	18,853	11,149	826	1,137

TABLE IV. LANDINGS PER MONTH (SHORT TONS)

Jan.	*Feb.*	*Mar.*	*Apr.*	*May*	*June*	*July*	*Aug.*	*Sept.*	*Oct.*	*Nov.*	*Dec.*
86.6	91.9	148.7	115.5	107.5	63.9	110.4	74.6	95.4	101.0	77.4	64.6

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

Type of Net	*Number*	*Average length*	*Average depth*	*Fees Paid*
Ring Net	3 ..	333 yds. ..	110 ft. ..	£30
Shore Seine	1 ..	600 yds. ..	23 ft. ..	£20
Gill	5,100 yds. ..	..	18 ft. ..	£26

APPENDIX V

AFRICAN FISHERY

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

Station	*Large Mesh Seine* 1948	1949	1950	*Small Mesh Seine* 1948	1949	1950	*Gill Nets* 1948	1949	1950
Malindi	—	8	24	829	5,208	3,752	—	12	56
Mateweri	369	420	168	542	229	168	—	120	175
River Shire	No record	891	613	No record	27	78	—	71	—
Mpemba	42	47	85	466	501	397	—	12	49
Monkey Bay	337	196	139	559	20	67	—	6	52
Kota Kota	259	380	377	334	166	91	—	3,192	1,230
Salima	143	430	200	—	427	170	—	12	—
Domira Bay	57	143	568	—	—	—	—	20	575

TABLE II. AVERAGE CATCH PER SINGLE HAUL OF NET AT RECORDING STATIONS

A. Small meshed shore seines.

Period and Station	*Tilapia (Adult)*	*Tilapia* (Immature)*	*Labeo*	*Clarias*	*Haplochromids*
MALINDI					
July–Dec. 1948	.4	45	.1	.4	1,187
Jan.–Dec. 1949	.4	5	.02	.02	1,045
Jan.–Dec. 1950	1.6	115	.9	5	596
MATEWERI					
July–Dec. 1948	.8	6.5	.01	.01	260
Jan.–Dec. 1949	1.1	110	—	.03	380
Jan.–Dec. 1950	2.7	45	.3	.4	815
MPEMBA					
July–Dec. 1948	.1	35	.02	.02	370
Jan.–Dec. 1949	.1	1.5	.01	.02	930
Jan.–Dec. 1950	.3	2.5	—	.1	400
RIVER SHIRE					
April–Dec. 1949	2.6	—	—	1.4	50
Jan.–Dec. 1950	1.5	—	.2	.3	25
MONKEY BAY					
July–Dec. 1948	3.8	2.5	.7	1.5	1,190
Jan–May and Dec. 1949	15	150	7	1	240
Jan.–Dec. 1950	17	1,350	32	.5	835
KOTA KOTA					
July–Dec. 1949	13.6	90	3.1	2.3	495
Jan.–Dec. 1949	23	5	8.7	7	135
Jan.–Dec. 1950	23	—	8	6.7	135
SALIMA					
Jan.–Dec. 1949	20.6	—	1.5	2.7	4,900
Jan.–Nov. 1950	42.6	—	5.6	2.8	740

B. Large meshed Seines.

Period and Station	*Tilapia (Adult)*	*Tilapia* (Immature)*	*Labeo*	*Clarias*	*Haplochromids**
MALINDI					
1948–1949	Few hauls negligible catches				
Jan.–Dec. 1950	7.5	1,285	11.3	1.2	75
MATEWERI					
July–Dec. 1948	40	20	.2	3	25
Jan.–Dec. 1949	266	15	3	1.5	11
Jan.–Dec. 1950	51	—	9	3	—
RIVER SHIRE					
April–Dec.1949	28	5	2	1.2	—
Jan.–Dec. 1950	25	—	2.6	1.5	—

*Small fish not counted individully but measured in four gallon tins. Number of tins converted to numbers of fish on basis of average number per tin. Round figures only.

B. Large meshed Seines.—*(Cont'd.)*

Period and Station	*Tilapia (Adult)*	*Tilapia* (Immature)*	*Labeo*	*Clarias*	*Haplochromids**
MPEMBA					
July–Dec. 1948 ..	114 ..	— ..	4 ..	2 ..	—
Jan.–Dec. 1949 ..	58 ..	45 ..	15 ..	7 ..	—
Jan.–Dec. 1950 ..	139 ..	55 ..	26 ..	3 ..	—
MONKEY BAY					
July–Dec. 1948 ..	40 ..	2,380 ..	7 ..	.2 ..	122
Jan.–May and Dec. 1949	18 ..	120 ..	7 ..	.1 ..	15
Jan.–Dec. 1950 ..	33 ..	20 ..	4 ..	.8 ..	10
KOTA KOTA					
July–Dec. 1948 ..	188 ..	210 ..	12 ..	10 ..	15
Jan.–Dec. 1949 ..	65 ..	— ..	38 ..	16 ..	—
Jan.–Dec. 1950 ..	76 ..	— ..	48 ..	14 ..	—
SALIMA					
Dec. 1948 ..	68 ..	— ..	9 ..	2 ..	—
Jan.–Dec. 1949 ..	34 ..	— ..	7 ..	6 ..	—
Jan.–Nov. 1950 ..	133 ..	— ..	6 ..	4 ..	15
DOMIRA BAY					
Dec. 1948 ..	230 ..	130 ..	12 ..	11 ..	4
Jan.–Mar. and Dec. 1949	137 ..	10 ..	10 ..	12 ..	—
Jan.–Dec. 1950 ..	194 ..	— ..	41 ..	9 ..	—

C. Open water small meshed seines.

MPEMBA					
Jan.–Dec. 1949 ..	.2 ..	— ..	— ..	.1 ..	320
Jan.–Dec. 1950 ..	.1 ..	— ..	— ..	.1 ..	185

TABLE III. SUMMARY OF CATCHES BY ALL METHODS OBSERVED AT RECORDING STATIONS 1950. (ACTUAL NUMBERS OF FISH)

Station	*Tilapia (Adult)*	*Tilapia* (Immature)*	*Labeo*	*Clarias*	*Haplochromids**	*Other*
Malindi	7,108 ..	474,000 ..	3,790 ..	2,960 ..	3,630,500 ..	21,089
Mateweri	11,335 ..	8,900 ..	6,747 ..	1,327 ..	162,750 ..	7,700
River Shire	31,496 ..	— ..	1,615 ..	3,333 ..	48,000 ..	10,500
Mpemba	11,953 ..	5,800 ..	2,487 ..	494 ..	214,000 ..	36,300
Monkey Bay	5,986 ..	79,000 ..	3,821 ..	3,939 ..	48,900 ..	11,400
Kota Kota	40,164 ..	300 ..	52,159 ..	11,448 ..	19,100 ..	37,400
Salima	39,323 ..	1,500 ..	2,621 ..	9,845 ..	140,000 ..	2,800
Domira Bay	110,525 ..	— ..	31,738 ..	8,198 ..	4,600 ..	29,900

*Small fish not counted individually but measured in four gallon tins. Number of tins converted to numbers of fish on basis of average number per tin. Round figures only.

APPENDIX VI

SUMMARY OF TRAFFIC AND FLIES CAUGHT AT DECONTAMINATION POSTS, 1950

Post	*Position*	*Number Motor Vehicles*	*Flies Caught*	*Number Cycles*	*Flies Caught*	*Number Pedestrians*	*Flies Caught*	*Total Flies*
Kota Kota	Outskirts Kota Kota Township (N)	1,723	30	4,343	35	42,594	31	96
Chota	Outskirts Kota Kota Township (S)	—	—	2,700	28	25,112	41	69
Mbobo	Approach to C.P. Highlands. Kota Kota—Lilongwe Rd.	817	29	1,730	51	22,111	30	110
Mvera	Approach to C.P. Highlands. Salima—Lilongwe Rd.	4,720	105	3,665	524	11,951	136	735
Fort Johnston	Outskirts Ft. Johnston Township. East of Ferry crossing	1,515	129	22,872	5,785	78,823	9,237	14,351
Kasupe	Approach to Zomba Highlands. Liwonde—Zomba Rd.	5,550	—	26,941	27	28,984	2	29
Chamatwa	Approach to Zomba Highlands. Namweras—Zomba Rd.	106	—	255	—	617	—	—
Lirangwe	Approach Shire Highlands. From Shire Valley. Matope Rd.	4,091	5	5,296	14	9,520	2	21

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