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Tsetse Fly Operations.

SHORT SURVEY OF THE OPERATIONS BY DISTRICTS
FOR THE YEAR ENDING DECEMBER, 1944.

By J. K. CHORLEY, Acting Chief Entomologist.

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[Extracted from the Annual Report of the Chief Entomologist.]

MEDICAL AND VETERINARY.

The problems which face this Colony, in the future, in connection with invasions of tsetse from Portuguese East Africa can be seen in broad outline to-day. Invasion by tsetse at many different points along our Eastern and Northern boundary from Darwin the north to the Limpopo in the south can be foretold. Three species of tsetse are involved, *Glossina morsitans* in the low veld on the extreme north and south, and *Glossina brevipalpis* and *Glossina pallidipes* at various points from Inyanga down to Mount Selinda and beyond.

Early in the year reports of heavy losses of stock in Portuguese East Africa, west of Mtoko, were received and two cases of nagana were reported from cattle in Rhodesia running close to the border. This threatened invasion was investigated during May and again in August. From Portuguese records it would appear that the *morsitans* belt in Portuguese East Africa south of the Zambesi river and east of the Ruenya river has been expanding rapidly for a number of years and has overrun the Ruenya (Luenya) river in the vicinity of Changara on the main Salisbury-Tete-Blantyre road. Heavy losses of stock had occurred in Portuguese East Africa between the border and the Mazoe river. Motor traffic was probably responsible for odd flies being carried to the border and the cases of animal trypanosomiasis recorded in Rhodesia. Further spread of the fly westward into Rhodesia is almost inevitable in the future but the spread may be less rapid owing to the comparative scarcity of the larger game. No immediate measures are considered necessary to combat the threatened invasion, but if the advance continues, active measures will be applied, including fencing and game destruction.

On the Eastern Border (Chipinga) a decrease in the incidence of animal trypanosomiasis has occurred and fewer farms have been involved. Good progress has been made in widening the border clearing in certain areas and the whole clearing was maintained by slashing back regeneration and by burning. *Glossina morsitans*, in addition to *brevipalpis* and *pallidipes*, has been recorded inside the Colony at this point for the first time, two specimens having been caught.

Further south at the junction of the Sabi and Lundi rivers the position has continued to deteriorate. A light but permanent infestation of *G. morsitans* is now established on the east bank of the Sabi river where it enters Portuguese East Africa. Cases of trypanosomiasis have occurred on the Ndanga side of the river and one tsetse has been taken on that side of the river.

South of the Sabi, in Portuguese East Africa, reports have been received of fly spreading towards our border and cases of nagana are reported less than twenty miles from the border. Arrangements are being made to carry out a tsetse survey south of the Sabi river in Portuguese East Africa during 1945 in conjunction with officials from the Union of South Africa.

In the northern districts satisfactory progress has been made in all areas.

On the invitation of Dr. P. J. du Toit, Director of Veterinary Services, Pretoria, I visited the Union Government's anti-tsetse operations in Zululand during May, inspecting the work in progress in the de-proclaimed Umfolozi and Mkuzi game reserves and in the Hluhluwe game reserve. My thanks are due to Mr. Renie du Toit, Research Officer, and Mr. E. B. Kluge, Veterinary Officer in Charge, who made all the arrangements and accompanied me on a most interesting and instructive visit.

During August, on the invitation of the Government of Nyasaland, I visited the Southern Province of that Territory to report on possible anti-tsetse measures. The investigation was made jointly with Mr. W. H. Potts, Senior Entomologist, Department of Tsetse Fly Research, Tanganyika. I have to thank Mr. C. de Meza, Chief Veterinary Officer, for the arrangements made and for the hospitality received.

Trypanosomiasis Committee.—Six meetings of the Trypanosomiasis Committee were attended in my capacity as Chief Entomologist, and Mr. M. C. Mossop, Entomologist, was elected Secretary to the Committee. Separate reports on these meetings have been submitted and copies sent to officials in neighbouring territories where similar problems exist.

One member of the committee, Mr. H. E. Hornby, O.B.E., F.R.C.V.S., inspected the area covered by our operations in the Hartley District.

Mr. T. Vaughan Jones, Acting Director of Game and Tsetse Control, Northern Rhodesia, addressed the Committee on anti-tsetse measures in Northern Rhodesia.

Mr. A. W. Redfern, O.B.E., M.P., Chairman, Natural Resources Board, attended one meeting and addressed the Committee, and a combined meeting of the Natural Resources Board and representatives of the Trypanosomiasis Committee met under the Chairmanship of the Minister for Agriculture and Lands, Captain the Hon. F. E. Harris, C.M.G., D.S.O., M.P., to discuss the question of game elimination operations and anti-tsetse measures.

Visitors.—During the year the following gentlemen visited the office to discuss problems in connection with anti-tsetse measures:—Mr. T. Vaughan Jones, Acting Director of Game and Tsetse Control, Northern Rhodesia; Mr. J. H. N. Hobday, Chief Veterinary Officer, Northern Rhodesia; Mr. W. H. Potts, Senior Entomologist, Department of Tsetse Research, Tanganyika; and Mr. W. S. F. Thomson, Field Officer of the same Department; Dr. de Sousa, of the Sleeping Sickness Mission, Portuguese East Africa; and Dr. de Sousa Santos, Veterinary Surgeon, Vila Pery, Portuguese East Africa.

A total of 27,272 head of game were destroyed for an expenditure of 59,495 rounds of ammunition, or 2.2 rounds per head. The species destroyed comprised:—

Elephant	13	Klipspringer	1,383
Rhinoceros	14	Stembuck	237
Buffalo	418	Sharpe's Stembuck	3,456
Eland	415	Oribi	162
Roan	151	Livingstone's Suni	47
Sable	1,160	Warthog	2,347
Waterbuck	572	Bushpig	435
Kudu	3,281	Lion	3
Zebra	423	Leopard	20
Lichtenstein's Hartebeeste	101	Cheetah	1
Tsessebe	52	Hyena	10
Impala	1,612	Wild Dogs	4
Reedbuck	668	Baboons	1,794
Bushbuck	1,893	Hippopotamus	3
Duiker	6,596	Lynx	1

My thanks are again due to the members of the British South Africa Police who superintended the operations at Chirundu and to the Native Commissioners at Sinoia and Darwin for the use of the Uleri lorry for the transport of supplies.

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Darwin.—Steady but encouraging progress has been made in reducing fly densities in the infested area west of the Hoya river. It is expected that the task of finally exterminating fly from this area will prove particularly difficult in view of the presence of elephant and rhinoceros in the thicket areas under the escarpment and adjoining the Umsengedzi river.

Except for a small area close to the junction of the Hoya and Umsengedzi rivers, close to the Portuguese border, tsetse appears to have been entirely eliminated from that portion of the Zambesi Valley lying east of the Hoya river.

The extension of the fly areas in Portuguese East Africa, where tsetse has been spreading down the Zambesi river fairly rapidly during the last few years may eventually outflank our cleared areas.

A new semi-permanent camp has been built on the Hoya river. Of the few head of milk cows taken to the Umsengedzi Mission during 1942 three or four contracted trypanosomiasis during the year.

Lomagundi (Doma).—There is no change to report in the fly position in the area north of the escarpment covered by our operations, game and fly being found in fair numbers over the whole of the area, particularly close to the Angwa and Hunyani rivers. Numerous herds of elephant are also present.

No tsetse were seen in the old cleared country south of the escarpment during the year. The escarpment, here, appears to form an almost complete natural barrier to fly, as no fly has been reported being carried up to the main camp at Tondongwe, which is situated on the edge of the escarpment, for several years.

Urungwe.—An outbreak of animal trypanosomiasis occurred early in the year on Rekometje Block and St. Mawes, a group of farms situated in an area subject to infestation by flies carried on motor traffic from the known infested areas north and west of these farms. To give a further measure of protection to these farms and also to the land reserved for post-war settlement situated south of this block, a new cleansing chamber was erected on the Catkin Mine road and a fly picket was established on the main Chirundu road twenty miles north of the cleansing chamber at Vuti. These are purely temporary palliative measures which will not give complete protection to this northern group of farms. Complete protection will not be afforded until our game elimination operations, which were only extended to the escarpment in 1940, have had time to eliminate the fly from the whole area south of the escarpment. This may take several more years.

Prospecting for mica has been particularly active during the year and new mines have been opened up right up to the escarpment and even in the Zambesi Valley below the escarpment. The effective control of this traffic has proved most difficult.

The western boundary of the Urungwe Native Reserve is still subject to invasion by occasional flies brought in by migrating elephant and wandering rhinoceros. In order to accelerate the progress of our operations in this area, the destruction of these animals, previously protected, has been authorised.

Over 4,000 head of native cattle have moved into the eastern portion of the native reserve and one concrete weir and four earth dams for the conservation of water have been constructed by the Irrigation Department. Only two cases of animal trypanosomiasis have been diagnosed from cattle in the reserve. There were four deaths.

The southern block of farms surveyed for post-war settlement is considered safe for occupation, but as a precautionary measure arrangements have been made to place a number of test cattle on the farms nearest to known fly, which farms may be considered as potentially somewhat less secure from the viewpoint of trypanosomiasis than those at a greater distance.

One more case of human trypanosomiasis has been reported from the Cheore river north of the escarpment.

Lomagundi S.W.—The general position in this area remains satisfactory, no tsetse having been seen east of the Sanyati river or north of the Umfuli river. West of the Sanyati river further progress has been made in reducing fly densities in the area covered by the operations.

Gatooma.—Steady but slow progress has been made in reducing fly densities in the triangle formed by the Umniati, Umfuli and Nyondi rivers. Although complete elimination of tsetse has not yet been achieved in this area, which is the only remaining portion of the Hartley district still infested, the vanishing point has been almost reached. Odd flies still persist on the Kahanda river in the Sanyati Native Reserve—stragglers from the extensive mopani belt north of the Sakugwe river.

West of the Umniati river further progressive reductions in fly densities have been made and ground recovered.

Sebungwe (late Wankie).—Recent surveys, made at the end of the dry season, indicate that fly has been eradicated everywhere south of the Mkulugusi forest ridge, as no fly were found at Cefula and Cewali pans on the Mzola river, two favourite dry season foci where occasional flies had been picked up during the previous few years.

The whole area between the Mkulugusi ridge and the road from the tin mines to the main camp at Siburu is now almost free from fly, only an occasional one being caught at a few specially favoured spots. Several herds of buffalo, some over 100 strong, are still present in the area and are probably responsible for the odd tsetse. Fly densities on the eastern side of the area, i.e., on the Sengwe and Lutope rivers, still remain fairly high, though progress can be reported. North of the motor road, including Pashu Native Reserve, a very great reduction in fly densities has occurred. In general, progress has been very satisfactory.

A few cases of trypanosomiasis were recorded from the Kana river at the beginning of the year, probably relapses.

Cattle continue to increase in the old cleared areas along the Gwaai and Shangani rivers west of the Shangani Native Reserve.

To the north beyond the area covered by our operations and where there is permanent game, tsetse has been spreading down the Sebungwe river and numerous deaths amongst cattle have been reported along the Zambesi river.

Eastern Border (Chipinga).—There has been a very encouraging drop in the incidence of animal trypanosomiasis throughout the area, sixty-three positive cases being diagnosed against two hundred and seventy in 1942. Seventeen farms were involved compared with thirty-three in the previous year. Severe drought conditions persisted throughout the winter and early summer but, as far as is known, these conditions have not contributed to the improvement in the position. Owing to the shortage of grazing heavy losses of stock occurred from poverty and the condition of stock throughout the area was very poor. Such conditions would have brought to light any latent cases of trypanosomiasis, particularly as the area was under close veterinary supervision owing to two outbreaks of African Coast fever.

The continued western spread of the tsetse *Glossina morsitans* towards our border has been mentioned in previous reports. Actual invasion of the Colony occurred during the year, two specimens having been taken on the farms Grampians and Pendragon. The presence of three species of tsetse on the border (*G. pallidipes*, *G. brevipalpis* and now *G. morsitans*) considerably complicated the problem and will be a severe test of the efficiency of the border clearings. It will add to the general sense of insecurity of the border farmers.

A total of eighty-six (86) tsetse were caught on or near the border clearing, comprising 64 *G. pallidipes* (21 male, 43 female), 11 *G. brevipalpis* (8 male, 3 female) and 11 *G. morsitans* (8 male, 3 female). Of this total 51 tsetse were caught in Southern Rhodesia, comprising 9 *G. pallidipes* (5 male, 4 female), 4 *G. brevi-*

palpis (2 male, 2 female) and 2 *G. morsitans* (1 male, 1 female). The remainder were caught in Portuguese East Africa on or near the clearings.

Seventy out of the total of 86 of these tsetse were caught in traps, of which about 155 were in use.

The border clearings were widened on the farms Mount Selinda Farfell, Pendragon and Bayswater. Regrowth was slashed back over the whole of the clearing and a very good burn of the whole area was obtained during September. Labour conditions were difficult throughout the year.

Sabi Valley.—In view of the extremely serious position which has slowly developed at the junction of the Sabi and Lundi rivers, controlled game elimination operations were extended into the Chibi and Ndanga districts early in the year. For the time being these operations are being restricted to a linear strip along both banks of the Lundi and the Sabi rivers, for a distance of about ten miles from their junction. This leaves the famed Chipinda pools outside the shooting area. More drastic measures may be necessary in the future, including the erection of game fences, when wire is procurable, and the destruction of all classes of game, including elephant, of which there are estimated to be over 1,500. The number of elephant in Portuguese East Africa adjoining the area covered by our operations has been estimated at several thousand.

A European hunter was employed for a short period destroying elephant in the small portion of the Melsetter district which lies south of Mt. Makossa. He succeeded, temporarily, in driving all resident elephant out of the area, but re-invasion both from Portuguese East Africa and from the Ndanga district occurred almost every night. Other measures to eliminate these elephant are to be employed.

Heavy losses of stock have continued to occur at Chief Mahenya's, whose herd has now been reduced from approximately 600 to under 150. Losses from nagana have also occurred at the Honde dip and at Chesa's kraal in the Ndanga district west of the Sabi river. A light infestation of tsetse (*G. morsitans*) is permanently present on the east side of the Sabi river and one fly has been caught on the west bank of the Sabi. This fly is assumed to have been carried across the river and it is not considered that permanent fly is as yet established on the west side of the Sabi river.

Owing to the drought, very extensive migrations of game, including elephant and buffalo, have taken place in the Ndanga district.

Traffic Control.—As mentioned elsewhere in this report, a new station was opened on the Catkin Mine road in the Urungwe district to deal with traffic from the mica mines west of the main Chirundu road and pickets were posted at a gate erected across the Chirundu road twenty miles north of the cleansing chamber at Vuti, to give added protection to the newly occupied farms just south of Vuti.

The following traffic was examined at these stations:—

(a) Vuti Chamber.—511 motor cars bringing 16 flies (11 male, 5 female); 1,969 pedestrians, 369 cyclists (773 parties) bringing 11 flies (5 male, 6 female); total 27 flies (16 male, 11 female).

Compared with 1932 (106), 1933 (94), 1934 (178), 1935 (454), 1936 (519), 1937 (241), 1938 (162), 1939 (62), 1940 (25), 1941 (67), 1942 (49), 1943 (56).

(b) Catkin Mine Chamber.—230 motor cars bringing 9 flies (5 male, 4 female); 485 pedestrians, 89 cyclists (337 parties) bringing 6 flies (4 male, 2 female); total 15 flies (9 male, 6 female).

Operative for five months only.

(c) Makute Gate.—83 motor cars bringing 32 flies (19 male, 13 female); 376 pedestrians, 45 cyclists (133 parties) bringing 68 flies (44 male, 24 female); total 100 flies (63 male, 37 female).

Operative for four months only.

(d) Chirundu Gate.—295 motor cars bringing 51 flies; 990 pedestrians, 184 cyclists (487 parties) bringing 422 flies; total 473 flies (sex unknown).

Compared with 1940 (360), 1941 (119), 1942 (276), 1943 (746).