

THE PROBLEM OF THE LECHWE (*Kobus leche*) ON THE KAFUE FLATS

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Most of the information in this article refers to the south bank of the Kafue Flats, though much will doubtless be applicable to other areas where lechwe occur. Ansell (1955) refers to the lechwe on the Kafue Flats as "red lechwe", and it has indeed been customary to apply this term to all lechwe in Northern Rhodesia, except those found on the plains around Lake Bangweulu and in the Chinsali District. The adult males of these latter have specially extensive black colouration, and have been called "black lechwe" (*K. l. smithemani*). But Ansell (1960) points out that the lechwe of the Kafue Flats are not the same as "red lechwe" from elsewhere, and has still more recently suggested (*in litt.*, 27th August 1960) that the relic population in the Balovale District west of the Zambesi, is not identical with that of the Busanga Swamp. The possible differences in these populations would appear to be in the length and sweep of the horns, and in the extent of black markings on the fore-legs of adult males. In this article we refer to all Northern Rhodesian lechwe populations without epithet.

The lechwe problem has already been discussed by Boyle (1958), Dorst (1958) and by Darling (1960). In the present article it is dealt with at greater length. The lechwe is a valuable animal which occupies vast plains which are seasonally inundated. Apart from its value as a source of meat, the herds provide an enormous and continuous supply of manure to these plains. As already suggested (Mitchell, 1958, *Oryx*, IV, 6, 1958, p. 235), this may have an important effect in maintaining the fertility of the water, and be responsible for the prosperity of a valuable fishery. It may also explain the quite exceptional assemblages of waterfowl, of which Dr. James P. Chapin, the celebrated American ornithologist, wrote (*Oryx*, III, 6, 1956, p. 329): "I doubt that I have ever beheld anywhere else such an impressive assembly."

The lechwe herds and legions of waterfowl do indeed afford a spectacle which has attracted and thrilled travellers from Europe and America, but the range of the lechwe on the Kafue Flats has been drastically reduced in living memory, probably mainly by hunting, but perhaps also by destruction of the

habitat by fire. The problem is how to manage the species so as to make the best use of it, and ensure its conservation in the accepted form of land use for the area.

DISTRIBUTION

Lechwe inhabit the extensive areas of floodlands characteristic of parts of the south-eastern Congo, Northern Rhodesia and adjacent country to the south-west, in south-eastern Angola, northern South-West Africa, northern Bechuanaland and the Caprivi Strip (Ellerman, *et al.*, 1953). There is another distinct species—Mrs. Gray's Lechwe (*Kobus megaceros*) in the southern Sudan. The most recent estimate of figures of the populations in Northern Rhodesia is by Ansell (1960) as follows: Kafue Flats, 25,000; Bangweulu, 15,000; Simaraha Flats (south-western corner of Kalomo District), 1,000; Busanga and Masozhi (near north-western boundary of Kafue National Park), 250; Luswishi River (Ndola Rural District), 150; Chisenga Island (near mouth of Luapula River, not "Chinsenga" as spelt by Ansell), 500. Actually a count in October 1960 by R. I. G. Attwell and one of us (J. M. C. U.) for the (separate) Busanga and Masozhi herds resulted in figures of respectively 215 and 148, and under the closer protection now being applied they appear to be slowly increasing. Also L. Allen, Game Officer, Mpika (*in litt.*, 8th August 1960) estimates that there are between fifty and 100 in the Nashinga Swamp in the Chinsali District, whereas twenty years ago herds numbering up to 1,000 could be seen. Ansell (1960) adds that no current estimate is available for Barotseland, and that elsewhere only scattered groups remain. His distributional map (*Mammals of N. Rhodesia*, supplement, p. 18) suggests that lechwe are widely and continuously distributed in Barotseland and the Balovale District. Actually they have practically disappeared from the neighbourhood of the Zambezi, and are only reported as at all numerous along the Mashu River (the boundary in the south-west with Angola), and in the Kalomo District (Grimwood, *et al.*, 1958). The map is also misleading in regard to the form *smithemani* ("black lechwe") around Bangweulu. There is no evidence in historical times that *smithemani* has ever extended north of the Bangweulu area except for a small population perhaps of this form in the Pambashye Swamp east of Kawambwa (Grimwood, *et al.*, 1958), which could conceivably have also existed on the eastern shore of Lake Mweru, at the mouth of the Kalungwishi River (Ansell, 1960, text).

With regard to the status of lechwe outside Northern Rhodesia,

we have no information on numbers found in the Angola-Caprivri-Bechuanaland region ; in regard to the south-eastern Congo, the only information available which is at all recent comes from the Directeur, Service de la Chasse et des Pêches, Leopoldville. He wrote to us in 1957 as follows :

“ This antelope is known only in the Katanga Province, where it lives in the valleys of the Lualaba as far as the neighbourhood of Ankoro (the Lualaba-Luvua confluence) and in the valley of the Luapula, including the swampy plains of Lake Mweru and some of its tributaries like the River Kafubu. The lechwe is not rare in these areas but it is not possible to be more precise on the subject of abundance.”

Except for the small Busanga herd, lechwe are not represented in any national park or game reserve in Northern Rhodesia, though on the Kafue Flats some 10,000 head are protected on the privately-owned Lochinvar Ranch ; there the number varies according to the season, but is probably never less than 6,000.

Distributed as the lechwe are in widely separated localities, long isolated from one another, it is not surprising that local differences may have arisen. Thus the “ black lechwe ” of the Bangweulu Swamps is a particularly well marked geographical form.

NATURAL HISTORY

The lechwe is a semi-aquatic antelope living on the margin of shallow water and feeding almost entirely on grasses in the water and on dry land. The most important foods of the lechwe are the valuable *Echinochloa stagnina* and *Oryza barthii*, both of which provide very heavy yields of highly palatable grass. During recent years severe fires late in the dry season have in considerable areas, burnt deep into the roots of the grasses causing immense damage, and it is possible that these fires may, by destroying the habitat, be partly responsible for the decline of the species. If this is so then the Kafue Flats are themselves being destroyed and degraded, and not only the lechwe but eventually the cattle industry will suffer. This matter requires further investigation.

The Kafue rises to high flood during April and May when the lechwe are confined to a narrow belt seldom exceeding three-quarters of a mile from the water's edge. During this high flood there is little grazing available in the water, so that the lechwe are forced to feed on the dry land pastures, which at that

time of the year, having already ripened and dried off, are of low food value. With a combination of cold nights and poor grazing, the animals lose condition rapidly. In June and July when the floods begin to fall, hundreds of square miles of beautiful grazing become uncovered and the lechwe's condition improves. There is indeed a great surplus of pasture which in the old days was shared with huge herds of buffalo, roan antelope, zebra and wildebeest as well as African-owned cattle. Today there remain on Lochinvar Ranch perhaps 2,000 zebra and 1,500 wildebeest, while the number of cattle varies between 2,000 and 8,000. There is no question of any competition with the lechwe, there being ample food for all at this season.

The Kafue reaches its lowest in November when it is virtually confined to the river channel and a few permanent marshes. With the advent of the first storms in late October or November, all the herds except the lechwe turn their backs on the Flats and return to their normal areas in the adjacent savannas. The lechwe alone remain, moving slowly back before the rising waters.

The lechwe drop most of their lambs from mid-July to mid-August. The season is, however, very prolonged. Thus a newborn lamb has been seen as early as 20th May, and a few in the second half of June, whilst a decreasing number are born from September onwards even to early December. A single lamb only is born; we have no records of twins. When due to lamb, the pregnant does leave the main herds singly or in small groups, and drop their young in patches of tall grass, often on high ground surrounded by the flood. There they remain hidden for a period of three to four weeks, before rejoining the herds. At all times there is a heavy mortality amongst tiny lambs, perhaps 50 per cent. It appears that lambs are weaned when between three and four months old, after which they can support themselves on the abundance of beautiful grazing then available. A second period of mortality has been observed in the dry season, when young lechwe, 12 to 14 months old, die as a result of warble infestations. Even second-year lambs are prone to these attacks, though not to the same extent.

The period of the main rut is from late October to December but continues sporadically until the end of the rains. It is not certain at what age the does give birth to their first young, but it may be as early as their second year, certainly by their third year. Game Guard Rodwell states that he has been told by old Africans that captive lechwe have lived to bear up to nine young, which would put their maximum age at upwards

of twelve years. No fierce fighting takes place during the rutting or any other season, although mock fights between males are staged at all seasons. But often a male accompanied by a group of females is left severely alone by other males, suggesting that he will tolerate no interference.

At twelve months the young bucks have horns, simple spikes up to 5 in. long. By two years they may be 11 in. long and have up to eight rings, the horns having a slight inward curve. By three years they will be from 10 in. to 18 in. long with an inward and forward curve and up to twenty rings. The adult ram carries the typical lyre-shaped horns with the tips still rather close together, and seldom has less than twenty-four rings. With increasing age the tips of the horns become wider and wider apart due to the growth of bone between their bases. The maximum length of horns appears to be reached at about five to six years, a good head being in the region of 32 in. on the front curve—the record, shot by Mr. Len Vaughan, being 36¼ in. (see frontispiece to Report of the Trustees and Director of the National Museums of Southern Rhodesia for 1952). The black mark on the front of the fore-leg and shoulder, characteristic of the adult male of the lechwe of the Kafue Flats, probably becomes apparent at three to four years of age, although always lacking in a few individuals. The females are hornless, though one doe with short thin horns has been seen.

On the Kafue Flats there is no doubt that there are considerably more male than female lechwes. On Lochinvar and in the vicinity the percentage of males among adults may well exceed 60 per cent. This high proportion would appear to be because females are more easily killed than males, especially in the communal hunts. In bygone days the skins of females and young animals were worn regularly by Ila women, but not those of males which are too tough and coarse. According to C. M. N. White, the skins of females are still used at puberty ceremonies and at funerals. By contrast with the preponderance of males on the Kafue Flats, L. Allen, Game Officer, Mpika (*in litt.*, 6th May, 1960), as a result of a count of fifty-nine groups of lechwe in the Bangweulu Swamps, found that the proportion of males was as low as 30 per cent, while observations made during the count of the Busanga/Masozhi herds already mentioned suggested a figure as low as 22 per cent.

On the other hand, T. R. H. Owen tells us that in Mrs. Gray's Lechwe the proportion of the sexes may be about equal. The proportion of adult males (black with white shoulder patch) to the total is about 25 per cent, and maturity is probably

reached at about three years. This ratio is probably the natural one, because according to Owen the local Dinka people do not systematically hunt the lechwe.

As stated above the does give birth to lambs at the time of the year when the floodland grazing is becoming available. This closely follows the period when conditions are at their hardest. It is not surprising, therefore, that a number of old does die at lambing because of their poor condition. The very old rams, however, tend to suffer most during the period of poor grazing from April to June and presumably live longer than the breeding does. There is little mortality in either sex from natural causes after they have passed the stage of susceptibility to warbles.

Lechwe are preyed upon principally by hyaenas, crocodiles, cheetahs and wild dogs (in this order of frequency), whilst on the Luwato Island and in some other parts, lions also take a toll. It is likely also that some young are killed by pythons, but we have as yet no positive record of this. Lechwe cannot run very fast on dry ground, and are fairly easily caught by dogs. However, in shallow water they are probably faster than any other animal. They therefore readily take to water, especially the females, and tend to spend the night close to the water's edge or on small islands.

Like other members of the genus *Kobus* (in the extensive sense used by Ellerman, *et al.*, 1953), herd structure is very loose and flexible, the herds constantly breaking up and reforming, though there is a general tendency for the sexes to run in separate herds, especially the does at lambing time.

THE LECHWE'S RANGE ON THE KAFUE FLATS

The Kafue Flats stretch all the way from the Meshi Teshi gap 30 miles west of Namwala, almost down to the railway crossing in the Mazabuka District, a distance of about 140 miles, varying from 10 to 30 miles in width. The total area habitable by lechwe is from 2,500 to 3,000 square miles, but the area available at any time depends on the state of the flood. Lechwe have a preference for those places where streams open out on to the Flats, and like to rest on the dry edges, where there is firm ground underfoot or at least where it is not too soft. The outlet of such streams as flow into the Flats is characterized by extensive dambos (moist, spongy areas) three-quarters of a mile or more in width. These dambos are occupied by the lechwe at the end of the rainy season and through the period of high

flood. Their margins afford a vital contribution to the grazing which at that time of the year is of low quality and inclined to be inadequate for the needs of the herds.

It is unlikely that at any time in the past lechwe have been distributed uniformly throughout the length of the Flats. At periods when the population was high, the animals would have dispersed and temporarily occupied more or less unsuitable situations, but they would have withdrawn to the preferred areas as soon as their numbers fell.

The following unpublished notes give some indication of the distribution of lechwe in the last fifty years :

1909. Mrs. H. Skinner, Mazabuka. "There were thousands of lechwe west of Namwala on the south bank. I don't remember how far west they stretched, but you could see all you wanted within four miles of Namwala. I would say there were as many as there were on Lochinvar in 1955."
1918. J. B. du Plooy, Mazabuka. "Lechwe extended all the way from Kafue railway bridge to Namwala, thin in some places. The heaviest concentration was at Namatushi, 2 miles east of Lochinvar. A heavy concentration was at the Mukuyu spur just east of the Magoye outlet. Could see 30,000 to 40,000 in a day's trek of 20 miles. Distribution on north bank much the same, especially dense north of Nalumba."
1920. L. E. Vaughan, retired from the Game Department. "Thick all the way from Inverue to Namwala, a few beyond, on north bank all the way to Iyesha."
1922. H. B. Bennett, Mazabuka. "Lechwe all the way from Mazabuka to Kantengwa, not quite as thick as on Lochinvar today."
1930. E. K. Mackenzie, Livingstone. "More on south bank than on north bank where there were none west of the Namwala pontoon."
- 1949-50. J. van Zyl, Lochinvar. "More lechwe on Lochinvar than today but very few off the ranch."
- 1953-54. W. F. H. Ansell. "Approximately a few hundred head on Veterinary Research Station and on farms to the east. Then a complete gap of over 20 miles on south bank to the eastern boundary of Lochinvar with no lechwe whatsoever. From there lechwe again present to beyond the Bwengwa, about where they stand today. On the north bank they ranged from the confluence of the Luwato and the Kafue to a few miles further west than on the south." (See also Ansell, 1955.)

1957. Chief Mwanachingwala agrees that in old days lechwe ranged all along the Flats in the Mazabuka District.

1961. The position is still much the same as reported by Ansell in 1954.

On the south bank the range has been reduced from approximately 80 miles to about 30 miles, and lechwe have virtually ceased to exist on the Nanzhila and Mulele outlets west of Namwala, and on the Kabulamwanda and the Magoye outlets. Very suitable habitat exists in these places and, according to the above statements, they are known to have carried heavy lechwe populations in the past. The only exception to this is that a few individuals are still to be seen occasionally at the Nanzhila outlet.

The main streams which are the core of the surviving lechwe herds are the Bwengwa just west of Lochinvar, in the Namwala District, the Nampongwe on Lochinvar, and the Kaleya on the Veterinary Research Station. The best of these is the Bwengwa outlet. On the north bank the outlets of the Nansenga, Lutale, Nangoma and Mwembeshi all provide suitable habitat, but it is only on the Nangoma that large numbers are still found.

NUMBERS

The limiting factor to a lechwe population is the amount of grazing available at high flood when there is a minimum of grazing available in the water, and when the dry-land grasses, being ripened and dried off, have a low food value. At this time of the year the lechwe distribution is more or less linear, in a narrow belt along the flood line. Judging by Lochinvar a population of 1,200 to the mile of flood line, causes severe overgrazing, but 800 to the mile can be carried without damage to the pasture. We therefore believe 1,000 animals to the linear mile to be the maximum number which can be carried in safety.

In 1934 Pitman estimated the lechwe population of the Kafue Flats to be about 250,000, but if we apply the above considerations, we can conclude that the maximum number which could have been carried was about 160,000. In 1955 Ansell estimated the total lechwe population on both sides of the Kafue Flats to be between 25,000 and 26,000 and counts carried out in 1958, 1959 and 1960 showed little change. In fact the number is now more or less static, there being 14,000 on the south side of the Flats and 11,000 on the north side. The population may therefore be considered to have dropped to 25,000 either from 250,000 or from 160,000 according to whether Pitman's

estimate or our calculation is accepted. It has fallen perhaps to one-eighth and certainly to one-fifth of what it was twenty-five years ago.

HUNTING

In the early days lechwe were apparently not hunted to any great extent. There was, at that time, plenty of other game, including big herds of buffalo and eland and a wide selection of other species which afforded easier hunting in the bush. No doubt, too, the human population was very much smaller. The lechwe were largely caught with the aid of dogs, and in snares set on places such as termite mounds to catch the animals by the foot when they came to lie down and rest. Game drives, when held, must have been on a very small scale. To quote Smith and Dale (1920): "The writers have known men who, previous to the European occupation, had never been twelve miles from their villages for fear of capture or death. It is the security engendered by the European occupation that has let loose these hundreds or thousands of hunters with dogs on the lechwe, and their invariable success cannot fail very seriously to diminish the numbers of this beautiful antelope."

Until the lechwe drives or "chilas" were stopped (after the 1957 activities, see below) they were carried out at two different seasons of the year. The first hunts took place usually at the time of high flood in April or May, the latter hunts in September. At both these times it was possible to enclose the lechwe against deep water, either the high floods or loops of the Kafue River itself. The old grass, dry in September, was fired to assist the hunt. Each organized hunt would last two to four days. An area was chosen where the hunters could encircle the lechwe as far as possible, such as a big bay in the flood line, perhaps a mile and a half or more across, around which the hunters could form into a horseshoe. The largest "chilas" ever held are believed to have taken place in 1952, when some 3,000 lechwe were killed on Lochinvar Ranch in three days, and a further 2,000 between the Veterinary Research Station and the Mukuyu spur.

On the date decided upon the hunters moved out with their scotch carts and ox-drawn sleighs, and accompanied by their dogs, to camp on the edge of the Flats. At the big hunts in 1956 over 1,100 men were present, assisted by a large number of young boys to herd the cattle, which came to drag the 175 vehicles used to take away the meat. Over 2,000 lechwe were killed during this particular hunt, which lasted 2½ days.

On the morning of a hunt there was no great activity in the camp until about half past nine or ten o'clock, when the Chief called the hunters in for a meeting at which the tactics for the hunt were discussed. The carts and sleighs were then inspanned, and a great cavalcade moved off to the hunting arena, everybody in high spirits, whips cracking and pipes whistling. Some of the more active men ran ahead to take up positions to encircle the lechwe. The hunters were armed with from two to six spears each, the average number being three. Many carried an axe and many also a light marker stick with a tassel on the top, used to stake a claim on a carcass until it was convenient to skin it and cut up the meat. It took up to two hours for everybody to get into position. The dogs were mostly tethered, and kept up on dry land, to be loosed only when the lechwe were more or less exhausted.

When the ring of hunters was complete a few men entered the arena and moved towards the lechwe which were by now huddled in compact herds out in the deep water. They started driving the lechwe backwards and forwards in the water in order to tire them. It was now getting hot, and a considerable number of men had entered the water to close in on the doomed animals. The lechwe were chased up and down until eventually a party of perhaps 150 broke away and attempted to escape through the cordon of hunters. Many were speared in the water, others reached the dry land where the dogs were unleashed on them, and the number which escaped was very small. Some lechwe sought shelter away out in deep water perhaps a mile from the shore. They were killed or turned back by hunters in canoes.

By about four o'clock no live animals remained in the area, and the hunters were occupied with retrieving their bag.

These lechwe hunts, on foot in deep water, were extremely strenuous but entirely without danger to the hunters. We have witnessed seven of these hunts, in which a total of well over 4,000 animals were killed, the only human casualty being one man who trod on a spear.

At the hunts held in May 1956 a total of 2,379 animals were counted as killed, including no less than 935 adult females. At the 1957 hunts, held in June, the total was 1,993, including 914 adult females, an even higher proportion than in 1956. The seriously high proportion of females killed needs no emphasis, beyond pointing out that it only shortly preceded the peak of the lambing season.

Apart from damage by the "chilas" which were legally

recognized until 1957, a considerable amount of illicit day-to-day hunting was and still is carried on. This continual harrying of the herds has had the effect of driving the maximum number of animals into the sanctuary of Lochinvar, with the result that at times the ranch is seriously overstocked. Damage to the pasture and consequently to the well-being of the animals results. The position was critical during the prolonged high flood of 1956 during which many old males died of malnutrition. The total protection of the species, which formerly applied only to the north bank of the Kafue, has now been extended to cover the whole of its range.

Since 1957 no permits for "chilas" have been granted. One of the main reasons influencing this refusal has no doubt been the difficulty of proper control, leading to the killing of a disproportionate number of females. Instead, special licences have been issued, which in 1960 authorized the hunting of 1,500 male lechwe on the south bank. It has been reported that many of the licence-holders failed to "fill their bag", but as against this there is no doubt that illicit hunting continues, including that of females.

VALUE AS A NATURAL RESOURCE

Pitman (1934, p. 22) gives the weight of an adult male lechwe from the Kafue Flats as 260 lb. This must have been an unusually heavy animal. Five adult males which we weighed averaged 216 lb., fourteen adult females 160 lb., and twelve yearlings 85 lb. The 2,379 animals killed in the 1956 hunts consisted of 900 adult males, 935 adult females, and 544 yearlings. The total weight may be calculated at:

			<i>lb.</i>
Adult males	.	900 @ 216	194,400
Adult females	.	935 @ 160	149,600
Yearlings	.	544 @ 85	<u>46,240</u>
Total	.	.	<u>390,240</u>

The weight of meat realizable may be taken as approximately 50 per cent, or 195,120 lb. The local price of meat varies between 1s. and 2s. per lb. Taking it conservatively at the lower figure, the cash value was no less than £9,756. It may also be that the hides are a marketable commodity.

It has already been suggested that lechwe manure may have an important effect on the fertility of the water. At fishing camps on the Kafue Flats during 1960, the average monthly catch per 100 yards of gill net was as follows:

<i>Camp</i>	<i>Average weight (lb.)</i>	<i>Abundance of Lechwe</i>
Nyimba (Lochinvar Ranch)	95·6	very plentiful
Ceres (near Mazabuka)	17·3	very few
Chikunka	33·0	a few
Kafue Town	54·4	none
Busangu (25 miles east of Namwala)	16·5	a few

The figure for Nyimba certainly supports the above suggestion, though it is still to be explained why the figure for Kafue Town, where there are no lechwe, should be fairly high. Further figures are very desirable, and are now being systematically compiled.

CONCLUSION

The lechwe is a natural resource, valuable in its own right as a meat supply to Africans ; valuable again in maintaining stocks of wildfowl which are eaten over the whole of the Federation ; very valuable, as we believe, in maintaining a considerable fishery which supplies the townships of Northern Rhodesia. The herds also afford an outstanding spectacle which could be developed to profit the whole tourist industry. The difficulty lies in their proper protection and the cropping of the animals within reasonable limits.

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