# THE KANGAROO INDUSTRY IN QUEENSLAND

By C. ROFF\* and T KIRKPATRICK, B.Sc.†

#### SUMMARY

As an introduction to current ecological studies of marsupials in Queensland, information on the kangaroo industry is presented and reviewed.

Personnel engaged in the industry; numbers and species taken, and districts of origin; times and areas of operation; methods of killing, skinning and treating; offal disposal; marketing and prices; ammunition costs; factors influencing annual harvests; and pest status are discussed.

For more than 40 years this native fauna has successfully supported an annual crop of some 350,000 skins, as well as the killing of indefinite numbers of animals as pests and for sport.

During the period 1950-1960 the annual harvest has been approximately 450,000 (81.5 per cent.—95.8 per cent. kangaroo) skins, conservatively assessed as worth £150,000 at the level of prices to shooters.

From observations some species have been affected in and adjacent to well-developed farming communities. There is, however, no quantitative evidence that past and current practices have had a detrimental effect on State-wide populations of larger macropod marsupials.

#### I. INTRODUCTION

The larger macropod marsupials such as kangaroos, wallaroos and wallabies have been hunted in Queensland for profit as well as for sport and as pests for many years. A substantial industry is based on the sale of skins and, more recently, the carcasses of these animals.

The destruction of native fauna has been permitted under State conservation laws dating from 1877 (see Appendix). The current legislation, *The Fauna Conservation Act of* 1952, which came into operation on January 1, 1954, makes provision for an open season throughout the year for the following species (after Iredale and Troughton 1934) which may be taken by those in possession of the necessary permit:

Grey kangaroo, Macropus major Shaw (Figure 1)

Red kangaroo, Megaleia rufa Desmarest (Figure 2)

Eastern or dusky [or North Queensland] wallaroo, Osphranter robustus Gould (Figure 3)

Whiptail, grey-face or pretty-face wallaby, Wallabia elegans Lambert

Red-necked, scrub or eastern brush wallaby, Wallabia rufogrisea
Desmarest (Figure 4)

Black-tailed or swamp wallaby, Wallabia bicolor Desmarest

Sandy [or agile] wallaby, Wallabia agilis Gould

Black-striped wallaby, Wallabia dorsalis Gray

Red-legged pademelon, Thylogale stigmatica Gould

<sup>\*</sup> Fauna Officer, Queensland Department of Agriculture and Stock.

<sup>†</sup> Entomologist, Queensland Department of Agriculture and Stock.

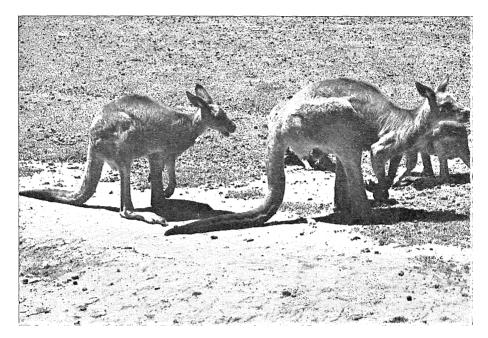


Fig. 1.—Grey kangaroo, Macropus major Shaw.

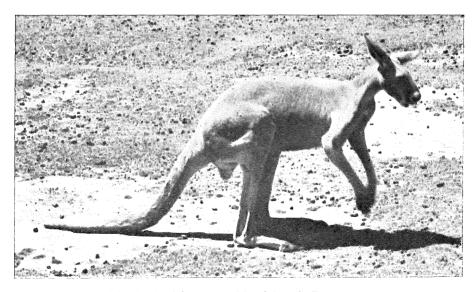


Fig. 2.—Red kangaroo, Megaleia rufa Desmarest.



Fig. 3.—Eastern or dusty wallaroo, Osphranter robustus Gould.



Fig. 4.—Red-necked, scrub or eastern brush wallaby, Wallabia rufogrisea

Desmarest.

Provision is also made in the Act for obtaining for the first time details of species taken within the industry. Both shooters and skin dealers are required to work under a permit system which ultimately provides information as to localities or holdings where the shooters operate, the numbers of skins handled by dealers and the species concerned.

Numbers of marsupials killed purely for sport or as pests without sale of skins or carcasses are unobtainable under legislative requirements. Although reasonably accurate estimates are not practicable, the numbers are certainly small when compared with the known yearly harvests. Under *The Sugar Experiment Stations Acts*, 1900 to 1959 bounties are paid for wallabies killed as pests in the central and northern sugar cane districts: some details of these operations in recent years are available.

# II. NUMBERS AND SPECIES TAKEN, AND DISTRICTS OF ORIGIN

Longman (1923) remarked: "No definite figures are available as to the number of pelts coming annually to the Brisbane market, but in answer to my inquiry Messrs. Mactaggart Bros., Ltd., have kindly made an approximation of between 300,000 and 400,000 skins; this number, however, includes in addition to kangaroos and wallaroos all descriptions of wallabies."

Details of skins passing through the hands of dealers during the years 1954–1960 are given in Table 1. Of the nine species listed previously, the trade, under the heading of brush wallaby, include skins of the black-striped wallaby with those of the red-necked, scrub or eastern brush wallaby: the red-legged pademelon is not harvested. Grey and red kangaroos are clearly the species on which the marsupial skin industry depends for its existence.

Table 1

Numbers of Marsupial Skins Harvested, 1954–1960

|      |  | Total               | Species (%)      |                 |          |                     |                  |                  |                  |  |  |  |
|------|--|---------------------|------------------|-----------------|----------|---------------------|------------------|------------------|------------------|--|--|--|
| Year |  | Number<br>Harvested | Grey<br>Kangaroo | Red<br>Kangaroo | Wallaroo | Whiptail<br>Wallaby | Brush<br>Wallaby | Swamp<br>Wallaby | Sandy<br>Wallaby |  |  |  |
| 1954 |  | <br>218,459         | 58.47            | 31.43           | 1.50     | 3.61                | 2.94             | 0.76             | 1.24             |  |  |  |
| 1955 |  | <br>305,616         | 51.03            | 30.63           | 3.65     | 3.8                 | 5.09             | 4.2              | 1.6              |  |  |  |
| 1956 |  | <br>361,462         | 50.81            | 30.71           | 5.98     | 3.81                | 3.85             | 3.36             | 1.44             |  |  |  |
| 1957 |  | <br>631,034         | 44.86            | 43.75           | 4.73     | 2.18                | 2.33             | 1.10             | 1.01             |  |  |  |
| 1958 |  | <br>295,820         | 58.29            | 30.16           | 4.12     | 3.77                | 2.38             | 1.07             | 0.17             |  |  |  |
| 1959 |  | <br>1,006,919       | 31.76            | 58.47           | 5.46     | 0.91                | 2.49             | 0.67             | 0.21             |  |  |  |
| 1960 |  | <br>769,948         | 63.39            | 32.47           | 1.34     | 0.71                | 1.04             | 0.86             | 0.16             |  |  |  |

Data on geographic origin of skins for 1954 and 1959, the years of smallest and largest harvests (see Table 2), have been dissected on the basis of statistical divisions (Figure 5), which has proved reasonably satisfactory. Allowing for some inaccuracies introduced by a few itinerant shooters marketing skins outside the districts in which these were taken (e.g. red kangaroos recorded from the

Table 2

Geographic Origin of Skins: Numbers Harvested in Statistical Divisions during 1954 and 1959

| Species          | Year | Penin-<br>sula | Cairns | Towns-<br>ville | Mackay | Rock-<br>hampton | Mary-<br>borough | Moreton | Downs  | Roma    | South<br>Western | Far<br>Western | Central<br>Western | North<br>Western | Un-<br>specified |
|------------------|------|----------------|--------|-----------------|--------|------------------|------------------|---------|--------|---------|------------------|----------------|--------------------|------------------|------------------|
| Casa language    | 1954 |                | 115    | 424             | 2      | 1,753            | 1,945            | 259     | 36,637 | 42,181  | 12,632           | 30             | 5,760              | 135              | 25,880           |
| Grey kangaroo    | 1959 | 29             |        | 111             | 286    | 12,923           | 5,841            | 2,454   | 64,049 | 104,701 | 58,433           | 306            | 25,300             | 239              | 45,157           |
| Dad Iransana     | 1954 |                |        | 5               |        | 47               | 37               |         | 5,604  | 7,946   | 20,998           | 1,123          | 14,236             | 4,002            | 14,385           |
| Red kangaroo     | 1959 |                |        | 12              |        | 1,331            |                  | 215     | 5,078  | 7,025   | 452,010          | 3,044          | 89,777             | 10,235           | 20,080           |
| Wallaroo         | 1954 |                |        | 200             | 1      | 235              |                  | 3       | 491    | 153     | 425              | 62             | 923                | 214              | 588              |
| wanaroo          | 1959 | ••             | •••    | 1               | 54     | 303              | 30               | 144     | 357    | 2,264   | 23,044           | 463            | 1,629              | 149              | 26,593           |
| W/h:=4=:111-1    | 1954 | ••             | 7      | 408             | •••    | 3,664            | 1,636            | 570     | 185    |         |                  | ••             |                    |                  | 1,437            |
| Whiptail wallaby | 1959 |                | •••    | 7               | 79     | 4,233            | 1,290            | 1,842   | 1,052  | 465     | 49               |                | 1                  |                  | 155              |
| D                | 1954 | •••            |        |                 | •••    | 1,509            | 704              |         | 2,510  | 266     | 260              | •••            | 30                 |                  | 1,150            |
| Brush wallaby    | 1959 | • •            | ••     | 23              | •••    | 1,927            | 1,594            | 381     | 4,413  | 5,893   | 1,741            | 27             | 468                |                  | 8,674            |
| C 11 1           | 1954 | •••            |        | • • •           |        | 225              | 245              | 99      | 388    | 275     | 139              | •••            | 20                 |                  | 287              |
| Swamp wallaby    | 1959 | ••             |        |                 |        | 897              | 42               | 86      | 1,659  | 1,154   | 1,671            | • •            | 191                | ••               | 1,084            |
| C1               | 1954 | ••             |        | 58              | 3      | 708              | 520              | 846     |        |         |                  | •••            |                    |                  | 579              |
| Sandy wallaby    | 1959 |                |        |                 | 28     | 978              | 573              | 98      |        |         |                  |                |                    |                  | 477              |

Maryborough district), species distributions are in substantial agreement with field observations—i.e. grey kangaroo throughout the State, red kangaroo midwest to far west, wallaroo midwest, red-necked, black-striped and swamp wallabies coastal and mid-western districts south of the Tropic of Capricorn, whiptail wallaby coastal districts and adjacent highlands, and sandy wallaby coastal districts only.

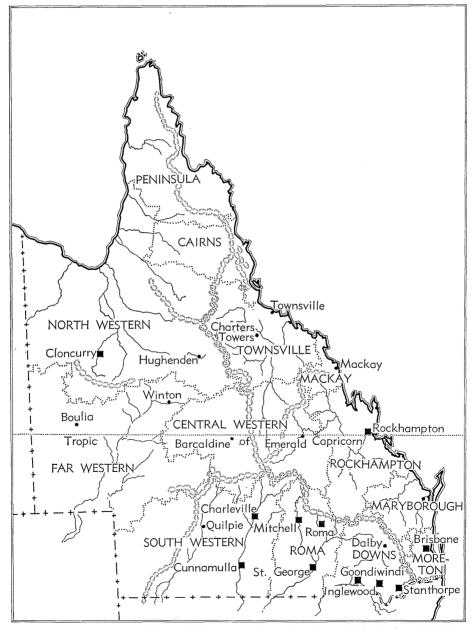


Fig. 5—Queensland Statistical Divisions. Locations of registered skin dealers (1960) are indicated by black squares.

Numbers of wallabies taken as pests in sugar-cane districts during 1950-1960, and for which a scalp bounty was paid, are given in Table 3. These are mostly sandy and whiptail wallabies, the former predominating, and only a negligible number of the skins is marketed. This "bounty" take is fairly consistent over a number of years, and represents an appreciable proportion of the total State take of the species concerned.

|         |    |       |       | Table 3    |           |       |    |
|---------|----|-------|-------|------------|-----------|-------|----|
| Numbers | OF | SANDY | AND   | WHIPTAIL   | WALLABIES | TAKEN | IN |
|         |    | Qu.   | EENSL | and, 1950- | -1960     |       |    |

|      | Year |  |   | Number Taken as<br>Pests in Sugar-cane<br>Districts* | Number Harvested<br>Elsewhere and Skins<br>Marketed |  |  |  |
|------|------|--|---|--|---|--|--|--|
| 1950 |      |  |   | 5,463  |   |  |  |  |
| 1951 |      |  |   | 12,649   |   |  |  |  |
| 1952 |      |  |   | 11,497   |   |  |  |  |
| 1953 |      |  |   | 10,948   |   |  |  |  |
| 1954 |      |  |   | 11,465   | 10,595  |  |  |  |
| 1955 |      |  |   | 9,517  | 16,503  |  |  |  |
| 1956 |      |  |   | 8,590  | 18,976  |  |  |  |
| 1957 |      |  |   | 11,709   | 20,130  |  |  |  |
| 1958 |      |  |   | 13,763   | 11,655  |  |  |  |
| 1959 |      |  | · | 13,676   | 11,277  |  |  |  |
| 1960 |      |  |   | 13,549   | 6,699   |  |  |  |

<sup>\*</sup> Number on which a bounty was paid.

Since 1959, small numbers of professional and casual shooters have been shooting kangaroos for carcasses (the meat trade) as well as the skins. Weight of meat sold and estimated numbers of carcases are given in Table 4. Practically all the skins pass through the hands of dealers and those for 1959-1960 are included in the yearly harvest as recorded in Table 1.

Table 4
Weight of Kangaroo Meat Sold, and Estimated Numbers of Carcasses, 1959–1961

|      | Year |       | Weight (long tons) | Estimated Number of Carcasses |
|------|------|-------|--------------------|-------------------------------|
| 1959 |      | <br>  | 39.00              | 2,500                         |
| 1960 |      | <br>  | 824.96             | 67,100                        |
| 1961 |      | <br>] | 312.79             | 22,300                        |

# III. PERSONNEL ENGAGED IN THE INDUSTRY; TIMES AND AREAS OF OPERATION

A relatively small number of efficient professional shooters and a large number of casual shooters operate during the period April to October, when better quality skins are obtained. Landholders and sportsmen shoot at all times of the year. Grey and red kangaroos are the main targets of the professionals; the market is supplied with wallaroo and wallaby skins largely by casual shooters. The numbers of shooters registered during 1954-1960 are given in Table 5.

Table 5

Distribution of Registered Shooters in Statistical Divisions, 1954–1960

| Year | Peninsula | Cairns | Townsville | Mackay | Rock-<br>hampton | Mary-<br>borough | Moreton | Downs | Roma | South<br>Western | Far<br>Western | Central<br>Western | North<br>Western |
|------|-----------|--------|------------|--------|------------------|------------------|---------|-------|------|------------------|----------------|--------------------|------------------|
| 1954 |           | 5      | 6          | • •    | 94               | 51               | 56      | 305   | 222  | 195              | 12             | 114                | 40               |
| 1955 | 1         | 5      | 15         | 5      | 21               | 44               | 33      | 326   | 266  | 348              | 81             | 127                | 51               |
| 1956 | ٠         | 7      | 12         | 3      | 200              | 93               | 118     | 408   | 324  | 252              | 40             | 266                | 79               |
| 1957 |           | 12     | 32         | 7      | 271              | 87               | 173     | 602   | 481  | 323              | 48             | 327                | 103              |
| 1958 | 1         | 6      | 8          | 4      | 97               | 38               | 38      | 339   | 312  | 201              | 27             | 103                | 37               |
| 1959 |           | 6      | 16         | 5      | 235              | 59               | 68      | 460   | 351  | 282              | 31             | 217                | 43               |
| 1960 | 1         | 6      | 15         | 2      | 219              | 43               | 54      | 553   | 329  | 307              | 34             | 192                | 21               |

Illegal casual shooters hunt, but there is no method of determining their numbers. Skins harvested by them are normally marketed in the names of registered shooters.

Shooters operate chiefly in the southern districts (Table 5); this is a reflection of many factors, including quality of skins taken in the southern part of the State, lower freight on skins and ammunition, and amenities associated with relatively closer settlement. The location of skin dealers is somewhat similar to the distribution of shooters (see Figure 5).

The shooting of kangaroos for the meat trade is centred on St. George, Goondiwindi and Inglewood.

# IV. METHODS OF KILLING, SKINNING AND TREATING

A commercial skin shooter operates a small plant consisting of motor truck or jeep-like vehicle and trailer, and camping equipment. Kangaroos and wallaroos are usually killed with  $\cdot 303$ ,  $\cdot 303/25$  or  $\cdot 22$  (hornet) calibre rifles, often fitted with telescopic sights. The  $\cdot 22$  calibre rimfire rifle is often used for wallabies. There is an increasing use of  $\cdot 222$  and  $\cdot 243$  calibre rifles.

As each animal is shot it may be skinned immediately or loaded on to the motor vehicle and skinned after a number of others are shot, the number varying according to the technique adopted by the shooter and the capacity of the vehicle. Skins are pegged on the ground with wire or broad-headed nail pegs and are sun-dried (Figure 6). Under good conditions, the skins are ready for stacking in 24 hours. Skins pegged and dried by inexperienced shooters are often processed poorly and bring a lower price on the market. Some shooters paint skins with insecticides for protection against hide beetle, *Dermestes maculatus* Deg.

A professional shooter may stay out five or six weeks before returning with the harvest (Figure 7). An efficient operator may take from 3,000 to 5,000 skins in a season. Most professionals concentrate on male kangaroos and limit the killing of females. The reasons offered by shooters for this attitude are: skins from females are classed as "fatty-backs" and are downgraded on the market, and limiting the takes of females helps to ensure continuity of supply.

The field equipment of a full-time carcass shooter is similar to that of a skin shooter.

Chest shooting is desirable when carcasses are required, as abdominal-shot animals are often rejected as unsuitable for the meat trade. Both sexes are taken, a minimum dressed weight of 28 lb being the only criterion. At a convenient butchering point, the heads, tails, feet and viscera are removed. Shooters either deliver cleaned carcasses to the town distributor, or the distributor may provide transport, for which a charge is made. Carcasses must arrive at the distributor's premises early in the morning after shooting: skins are removed and subsequently sold. Subject to demand, skinned haunches are accepted from casual shooters.

An efficient carcass shooter may take about 60 kangaroos daily.



Fig. 6.—Red kangarooo skins pegged out to dry, Eromanga, west of Quilpie.



Fig. 7.—Kangaroo shooters returning with skins, Charleville.

# V. OFFAL DISPOSAL

Carcasses or parts of carcasses are left where the animals are skinned or butchered for the meat trade. Occasionally landholders may stipulate that offal near waterholes and earth tanks be removed or burnt. Carrion-eating birds, principally crows, Corvus cecilae Mathews, ravens, Corvus coronoides Vigors and Horsfield, fork-tailed kites, Milvus migrans Boddaert, wedge-tailed eagles, Uroaetus audax Latham, and whistling eagles, Haliastur sphenurus Vieillot, feed on offal during the day. At night wild pigs, Sus scrofa L., foxes, Vulpes vulpes L., feral cats, Felis catus L., and dingoes, Canis dingo Meyer, take over. Carrioneating fauna cannot dispose of accumulated offal at a locale used repeatedly for skinning or butchering. Elsewhere, after several days little other than bones remains.

# VI. MARKETING AND PRICES

Skins may be marketed by shooters either through local dealers, who in turn forward them to Brisbane for auction, or by consigning to a Brisbane dealer direct. Some are sent to Sydney and Adelaide for sale. Brisbane dealers catalogue and grade the skins, which are then sold at fortnightly auctions, although private treaty sales are held between auctions.

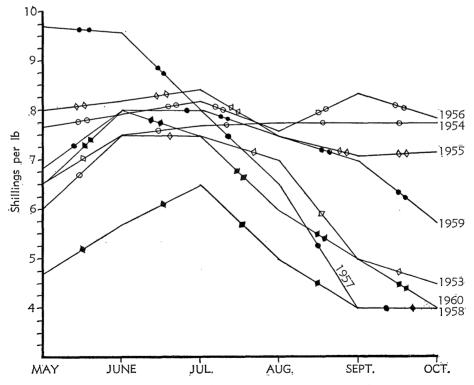


Fig. 8.—Monthly fluctuations in prices of first grade kangaroo skins, 1953-1960.

The prices for kangaroo skins determine the significant returns to shooters. These for the principal marketing months, May to October, have been compiled from Official Reports of Brisbane Fat Stock and Produce Brokers Association (unpublished) for the years 1953-1960 and are given in Table 6. Monthly fluctuations in prices of first grade skins, which reflect those for other grades, are more clearly set out in Figure 8. There is usually a gradual price increase from May to June, followed by an appreciable decrease. This trend is supposed to follow skin quality, although shooters do not agree with this explanation. They are of the opinion that the price structure is guided in the early part of the season for the purpose of interesting shooters. When this is achieved and skins are arriving in quantity on the market the prices drop.

Table 6

Brisbane Prices for Kangaroo Skins, per lb, 1953–1960\*

| Month  | 1  | Grade             | 1953                       | 1954                       | 1955                       | 1956                       | 1957                        | 1958                        | 1959                       | 1960                       |
|--------|----|-------------------|----------------------------|----------------------------|----------------------------|----------------------------|-----------------------------|-----------------------------|----------------------------|----------------------------|
| May    |    | 1st<br>2nd<br>3rd | s. d.<br>6 6<br>5 6<br>2 6 | s. d.<br>6 0<br>5 0<br>2 6 | s. d.<br>8 0<br>7 0<br>2 9 | s. d.<br>7 8<br>6 8<br>3 0 | s. d.<br>6 10<br>5 3<br>2 3 | s. d.<br>4 8<br>3 10<br>2 0 | s. d.<br>9 8<br>7 8<br>5 0 | s. d.<br>6 6<br>5 6<br>3 6 |
| June   | •• | 1st<br>2nd<br>3rd | 7 6<br>6 6<br>3 6          | 7 6<br>6 6<br>3 6          | 8 2<br>7 0<br>3 3          | 7 11<br>6 10<br>3 0        | 8 0<br>7 0<br>3 6           | 5 8<br>4 8<br>2 4           | 9 7<br>7 9<br>5 3          | 8 0<br>6 6<br>4 0          |
| July   |    | 1st 2nd 3rd       | 7 6<br>6 6<br>3 6          | 7 8<br>6 8<br>3 6          | 8 5<br>7 4<br>3 6          | 8 2<br>7 0<br>3 1          | 8 0<br>7 0<br>3 6           | 6 6<br>5 6<br>2 9           | 8 0<br>6 0<br>4 0          | 7 6<br>6 0<br>3 6          |
| August |    | 1st<br>2nd<br>3rd | 7 0<br>6 0<br>3 0          | 7 9<br>6 9<br>3 9          | 7 6<br>6 6<br>2 9          | 7 7<br>6 7<br>3 0          | 6 6<br>5 6<br>2 9           | 5 0<br>4 0<br>2 0           | 7 6<br>5 6<br>3 6          | 6 0<br>4 6<br>2 6          |
| Sept.  | •• | 1st<br>2nd<br>3rd | 5 0<br>4 0<br>2 0          | 7 9<br>6 9<br>3 9          | 7 1<br>6 1<br>2 11         | 8 4<br>7 3<br>3 6          | 4 0<br>3 0<br>1 0           | 4 0<br>3 0<br>2 0           | 7 0<br>5 0<br>3 0          | 5 0<br>3 9<br>1 9          |
| Oct.   |    | 1st<br>2nd<br>3rd | 4 6<br>3 6<br>1 6          | 7 9<br>6 9<br>3 9          | 7 2<br>5 10<br>2 9         | 7 10<br>6 6<br>2 9         | 4 0<br>3 0<br>1 0           | 4 0<br>3 0<br>1 10          | 5 9<br>3 9<br>2 0          | 4 0<br>3 0<br>1 6          |

<sup>\*</sup> An average skin weighs 1-13 lb.

Contract shooters for meat carcasses are paid 10s. per kangaroo less cartage; casuals receive 3½d. per lb. In 1959, when this trade was commenced, the meat was boned, packaged and frozen by the distributor for overseas export, carcasses being handled for this purpose during 1959-1960. At present the main outlet is to pet-food shops in Brisbane, Sydney and Melbourne.

#### VII. AMMUNITION COSTS

The cost of ammunition is a significant factor affecting the economic return to the shooter. An efficient shooter obtains as many as 90 skins (and/or carcasses) for every 100 cartridges expended. Few would remain long in the industry if their bag for every 100 cartridges fired were below 60.

Table 7 indicates the trend in ammunition costs (freight is an extra charge), and in general there has been a greater relative increase in these than in skin prices. Opportunity to offset this increase, however, is provided by reloading. Since 1958 there has been a gradual but increasing change over to  $\cdot 303/25 \cdot 222$  and  $\cdot 243$  ammunition for kangaroo shooting, with reloading of the last two calibres to reduce costs. The reloading gear costs approximately £32.

|          |        |     | Tab | le 7   |    |            |
|----------|--------|-----|-----|--------|----|------------|
| Brisbane | PRICES | PER | 100 | Rounds | OF | Ammunition |

|      | Year |       |       |     |         |       | Calit | ore |       |     |       |      |
|------|------|-------|-------|-----|---------|-------|-------|-----|-------|-----|-------|------|
|      | 1001 |       | ·303  |     | ·22 (Ho | rnet) | -303/ | 25  | ·22   | 2   | ·243  |      |
|      |      |       | s. d. |     | s. c    | 1.    | s.    | d.  | s.    | d.  | s.    | d.   |
| 1953 |      | <br>  | 88 0  |     | 88      | 0     |       |     |       |     |       |      |
| 1954 |      | <br>  | 68 0  |     | 68      | 0     |       |     |       |     | ١     |      |
| 1955 |      | <br>  | 59 0  | to  | 68      | 0     |       |     | ١     |     | l     |      |
|      |      |       | 68 0  | 1   |         | j     |       |     |       |     | j     |      |
| 1956 |      | <br>  | 70 0  |     | 97      | 0     |       |     |       |     |       |      |
| 1957 |      | <br>  | 68 0  | to  | 97      | 0     |       |     | ١     |     | ٠.    |      |
|      |      |       | 75 0  |     |         | 1     |       |     |       |     |       |      |
| 1958 |      | <br>  | 75 0  | -   | 107     | 0     | 75    | 0   | 160   | 0   | 230   | 0    |
| 1959 |      | <br>  | 75 0  |     | 107     | 0     | 75    | 0   | 176   | 0   | 247   | 3    |
| 1960 |      | <br>[ | 80 0  |     | 107     | 0     | 88    | 0   | 180   | 3   | 247   | 3    |
|      |      |       |       | - 1 |         |       |       |     | Reloa | ded | Reloa | ided |
|      |      |       |       |     |         |       |       |     | 55    | 0   | 70    | 0    |

### VIII. FACTORS INFLUENCING ANNUAL HARVESTS

In Table 8 are set out the numbers of registered shooters operating in Queensland, 1954 to 1960; the numbers of kangaroos harvested for skins, 1950-1960; seasonal conditions for the years 1950-60 assessed from Commonwealth Meteorological Bureau reports; and estimated average prices per lb of first grade skins, 1953-1960.

During dry seasons kangaroos are more readily and economically available, as the mobs congregate near the limited water and food; furthermore, more rural workers turn to skin shooting to supplement incomes. These are some of the factors which for many years have been presented as influencing the fluctuations in annual harvests.

The implementation in 1954 of legislation requiring the registration of shooters, which has given them some status and protection, has also tended to stabilize their numbers. There is an evident relationship between seasonal

conditions and harvests, while there is no doubt that the price of skins to shooters is a most important relevant factor. The poor harvest and appreciable drop in the number of registered shooters during 1958, which was a fair season, can be attributed to the relatively poor skin price during that year.

|      | <br>DATA | A CON | CERNI | ED WITH FLUCT                 | UATIONS OF AND                    | NUAL HARVEST           | S   |
|------|----------|-------|-------|-------------------------------|-----------------------------------|------------------------|---|
|      | Year     |       |       | No. of Registered<br>Shooters | No. of Kangaroo<br>Skins Marketed | Seasonal<br>Conditions | Estimated Average<br>Price for 1st<br>Grade Skins<br>(per lb) |
|      |          |       |       |                               |                                   |                        | s. d.   |
| 1950 | <br>     |       |       |                               | 202,733*                          | Good                   |   |
| 1951 | <br>     |       |       |                               | 348,334*                          | Dry                    |   |
| 1952 | <br>     |       |       |                               | 264,090*                          | Fair                   |   |
| 1953 | <br>     |       |       |                               | 246,484*                          | Fair                   | 6 0   |
| 1954 | <br>     |       |       | 1,100                         | 196,395                           | Good                   | 7 5   |
| 1955 | <br>     |       |       | 1,513                         | 249,565                           | Good                   | 7 10  |
| 1956 | <br>     |       |       | 1,802                         | 194,663                           | Good                   | 7 11  |
| 1957 | <br>     |       |       | 2,466                         | 559,096                           | Dry                    | 6 3   |
| 1958 | <br>     |       |       | 1,210                         | 261,652                           | Fair                   | 5 0   |
| 1959 | <br>     |       |       | 1,773                         | 908,543                           | Dry                    | 7 11  |
| 1960 | <br>     |       |       | 1,775                         | 738,072                           | Fair                   | 6 2   |

Table 8

Data Concerned with Fluctuations of Annual Harvests

# IX. PEST STATUS

Opinions vary as to the pest status of marsupials, although most landholders regard them as pests in some degree. The kangaroo industry in Queensland has continued mainly because landholders in general have encouraged shooters to operate on their properties; some have actually paid a bounty for every kangaroo shot. Others limit or debar shooting because of fear for their stock. Some of the more common statements on the pest status of marsupials are:

One kangaroo eats as much as 4-7 sheep.

Kangaroos being more active than sheep are the first to reach the best grass.

Sheep will not graze where kangaroos have fouled the grass.

Marsupials are troublesome in cultivations where these are insecurely fenced, or in marginal areas unfenced.

Kangaroos have a nuisance value to the community because of collisions with motor vehicles.

It is hoped to clarify the position with regard to these statements in future investigations.

As could be expected from the present generally indeterminate nature of the problem, the administrative aspects follow a similar pattern. Recent examples are:

"Under *The Stock Routes and Rural Lands Protection Acts of* 1944 the Stock Routes Co-ordinating Board, Queensland Department of Public Lands, operated a bonus system for kangaroos, wallaroos and wallabies from July 1945 to

<sup>\*</sup> Estimated from information supplied by five major Brisbane skin dealers.

January 1946 at the rate of 3d. per scalp. It was abolished at the request of the majority of western Queensland local authorities on the grounds that the market skin value of the marsupials was sufficient inducement for shooters to destroy these animals, and further that the wholesale destruction of marsupials was not altogether desirable as it resulted in an increase in the dingo menace. Additionally, the administrative problem of identifying scalps on which a bonus should be paid was never solved satisfactorily." (Unpublished records, Department of Agriculture and Stock.)

Under current fauna conservation, marsupials are not scheduled as pests, and from January 1, 1954, a royalty was payable: the objective was a fund to offset the cost of fauna research and administration. At the persistent request of graziers' organisations the royalty on grey and red kangaroos was waived (Queensland *Government Gazette* December 7, 1957, p. 1682; April 12, 1958, p. 1326; May 27, 1961, p. 1447; and April 7, 1962, p. 1030). The basic reasons for this request were that the royalty discouraged shooters and had an appreciable effect on seasonal kills. Data presented in Table 8 do not support these contentions.

# X. DISCUSSION

Over the 30 years prior to 1950, the average annual harvest of marsupial skins was an estimated 350,000. There are records of light and heavy seasonal kills. During the period 1950-1960 the annual harvest had been approximately 450,000 (81·5–95·8 per cent. kangaroo) skins (Tables 1 and 8), conservatively assessed as worth £150,000 at the level of prices to shooters (Table 6). For more than 40 years, therefore, this native fauna has successfully supported an annual crop of some 350,000 skins, as well as the killing of indefinite numbers of animals as pests and for sport. From observations, some species have been affected in and adjacent to well-developed farming communities. There is, however, no quantitative evidence that past and current practices have had a detrimental effect on State-wide marsupial populations.

In maintaining a reasonable balance between the requirements of fauna conservation and the destruction of marsupials as pests under a system of controlled harvesting, careful and continual consideration should be given to changing conditions. Accordingly, ecological studies of marsupials in Queensland, for which this review is an introduction, have been initiated.

# XI. ACKNOWLEDGEMENTS

The authors are indebted to various shooters, landholders and skin dealers for making information readily available. The Director of Sugar Experiment Stations kindly supplied the information on wallabies taken as pests in sugar-cane districts, and Mr. William Manley (Departmental Illustrator) assisted with the figures.

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#### **APPENDIX**

From 1877 to 1918, except for the period 1891–1895, various Acts relating to the destruction of marsupials and other mammals were in force under district Boards. These enactments did not achieve the designed purpose of reducing the alleged pest status of the larger macropod marsupials, and accordingly the Boards under optional powers discontinued the bonus on kangaroos and wallaroos in 1906. Subsequently the Government (see Annual Report, Department of Agriculture and Stock, 1918–1919, p. 2) withdrew the official endowment for the destruction of marsupials, limiting subsidy to foxes and dingoes.

Particulars of scalps destroyed in respect of which Board bonus subsidized by Government endowment was paid are given below.

(Received for publication May 3, 1962)

MARSUPIAL DESTRUCTION, 1877-1917
(As given in Annual Report of the Department of Agriculture and Stock, 1917-1918; p. 18)\*

| Year                     | Kangaroos<br>and Wallaroos | Wallabies  | Bandicoots, Pademelons<br>and Kangaroo Rats | Dingoes (in-<br>cluding Foxes) | Total      | Bonus Paid<br>(£) | Government<br>Endowment<br>(£)                   |
|--------------------------|----------------------------|------------|---|--------------------------------|------------|-------------------|--|
| 877–1878–1879            | 1,171,427                  | 595,531    |   | ••                             | 1,766,958  | 31,056            | 21,968   |
| 880–1881                 |                            | ••         | No Returns                                  |                                |            |                   |  |
|                          | 424,651                    | 551,276    |   |                                | 975,927    | 19,272            | 4,429  |
|                          | 361,450                    | 684,554    |   |                                | 1,046,004  | 24,550            | 18,323   |
| 884                      | 380,625                    | 570,290    |   |                                | 950,915    | 24,140            | 12,912   |
| 885                      | 312,139                    | 486,913    | 2,113                                       | 74                             | 801,239    | 21,847            | 11,088   |
| 886                      | 284,897                    | 449,656    | 13,207                                      | 9,833                          | 757,593    | 20,500            | 11,144   |
| 887                      | 175,363                    | 316,946    | 8,925                                       | 11,525                         | 512,759    | 17,543            | 12,845   |
| 888                      | 275,729                    | 445,080    | 24,377                                      | 19,552                         | 764,738    | 27,236            | 13,193   |
| 889                      | 312,476                    | 353,994    | 27,424                                      | 19,570                         | 713,464    | 26,741            | 14,617   |
| 890–1 Feb., 1891         | 259,208                    | 375,269    | 38,776                                      | 14,220                         | 687,473    | 21,596            | \[ \begin{pmatrix} 17,697 \\ 7,232 \end{pmatrix} |
| 891–1892                 |                            |            | No Act in Force                             |                                |            |                   |  |
| 893–1894–1895            |                            |            | No Returns Furnished                        |                                |            |                   |  |
| 896                      | 288,658                    | 522,653    | 24,449                                      | 16,782                         | 852,542    |                   |  |
| 897                      | 717,717                    | 601,307    | 177,811                                     | 26,000                         | 1,522,835  | Estimated at      | 16,959   |
| Jan30 June, 1898         | 290,163                    | 298,078    | 6,505                                       | 11,090                         | 605,836    | 106,450 ∫         | •  |
| 898–1899                 | 823,700                    | 851,022    | 36,138                                      | 24,447                         | 1,735,307  | 44,392            | 13,030   |
| 899–1900                 | 634,223                    | 620,109    | 29,912                                      | 20,331                         | 1,304,575  | 35,319            | 15,156   |
| 900–1901                 | 413,992                    | 816,300    | 40,517                                      | 24,939                         | 1,295,748  | 33,119            | 15,330   |
| 901–1902                 | 281,445                    | 751,061    | 30,684                                      | 21,289                         | 1,084,479  | 29,614            | 11,163   |
| 902–1903                 | 282,770                    | 636,856    | 48,768                                      | 18,148                         | 986,542    | 22,922            | 11,776   |
| 903–1904                 | 53,301                     | 190,353    | 9,279                                       | 12,477                         | 265,410    | 9,901             | 5,819  |
| 904–1905                 | 81,892                     | 208,631    | 36,164                                      | 10,176                         | 336,863    | 11,273            | 4,177  |
| 905–1906                 | 109,349                    | 339,815    | 84,887                                      | 19,420                         | 553,471    | 13,965            | 4,700  |
| 906–1907                 |                            | 398,284    | 81,746                                      | 9,758                          | 489,788    | 11,991            | 3,146  |
| 907–1908                 |                            | 474,387    | 127,618                                     | 11,493                         | 613,498    | 13,260            | 5,515  |
| 908–1909                 |                            | 509,006    | 105,110                                     | 13,897                         | 628,013    | 16,064            | 5,399  |
| Jul., 1909-31 Dec., 1910 |                            | 1,198,059  | 103,534                                     | 23,828                         | 1,325,421  | 31,420            | 5,260  |
| 911                      |                            | 708,501    | 40,055                                      | 21,508                         | 770,064    | 18,658            | 5,888  |
| 912                      |                            | 912,795    | 43,267                                      | 23,743                         | 979,805    | 25,340            | 6,272  |
| 913                      |                            | 787,558    | 18,627                                      | 18,757                         | 824,942    | 19,536            | 6,541  |
| 914                      |                            | 433,325    | 9,044                                       | 21,061                         | 463,430    | 15,665            | 3,468  |
| 915                      |                            | 319,437    | 14,048                                      | 25,924                         | 359,409    | 17,596            | 4,063  |
| 916                      |                            | 202,612    | 5,330                                       | 26,525                         | 234,467    | 17,143            | 3,596  |
| 917                      |                            | 220,721    | 4,197                                       | 18,916                         | 243,834    | 14,473            | 3,224  |
|                          | 7,935,175                  | 16,830,379 | 1,192,512                                   | 495,283                        | 26,453,349 | 742,581           | 295,934  |

<sup>\*</sup> Bonus and Government Endowment Figures are shown here to the nearest £.