Department of Primary Industries and Regional Development
GOVERNMENT OF WESTERN AUSTRALIA

Journal of the Department of Agriculture, Western Australia, Series 4

Volume 25
Number 1 *1984*

Article 13

1-1-1984

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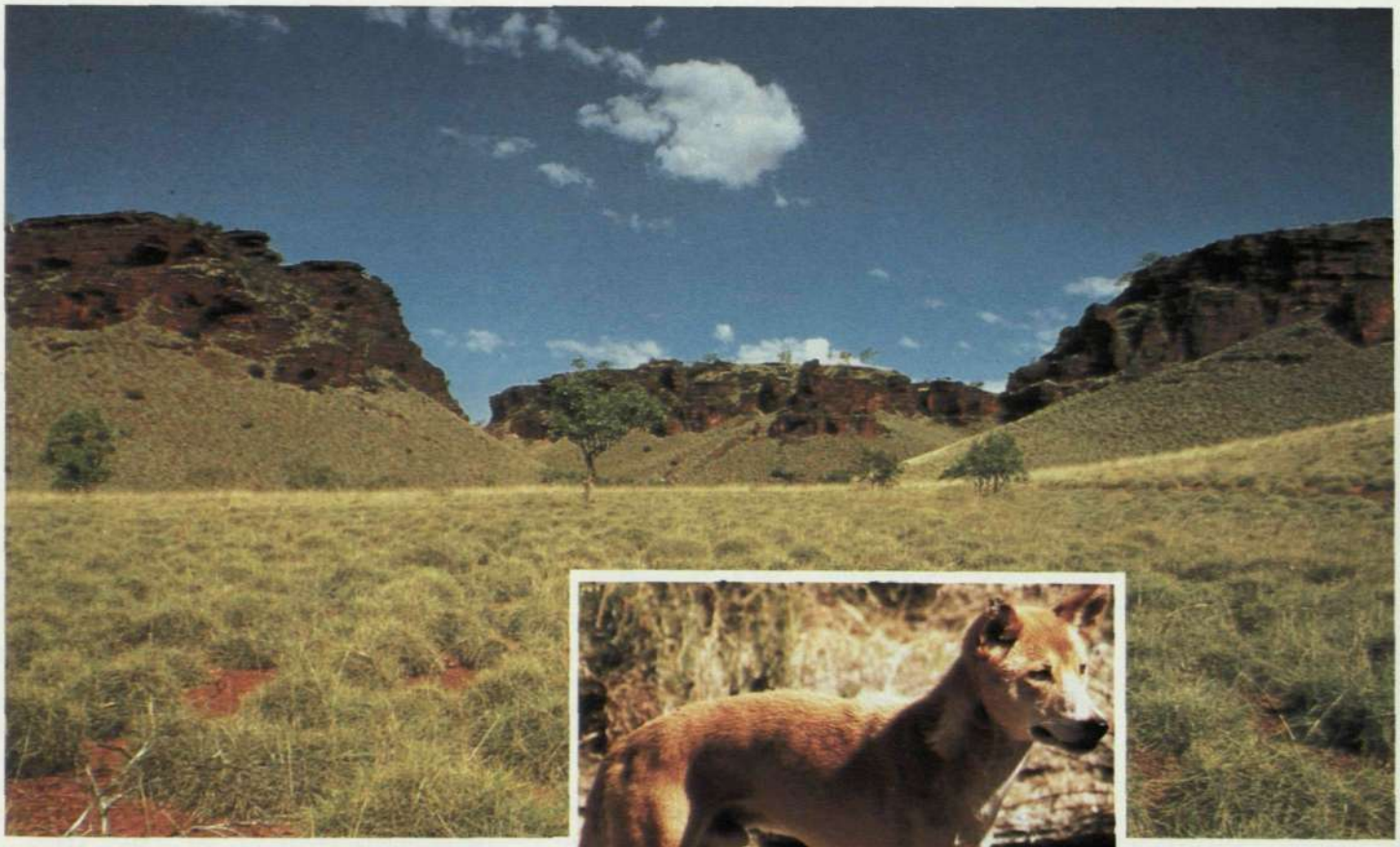
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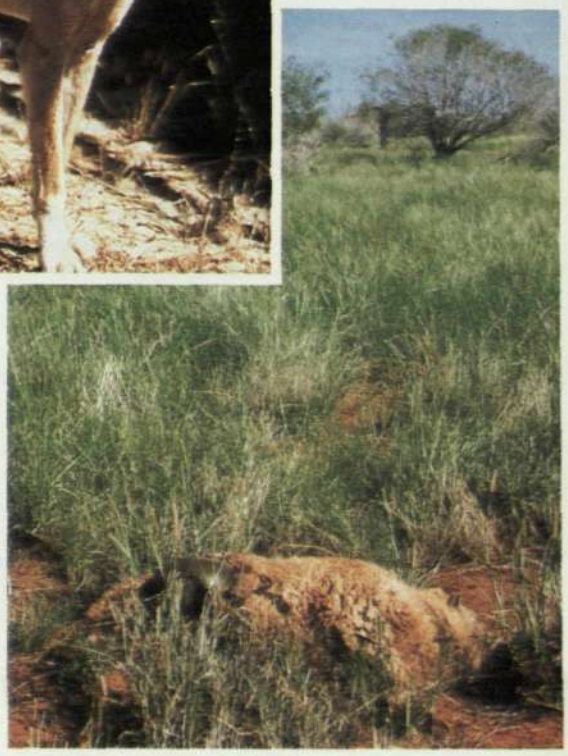
Thomson, P C. (1984) "Dingoes and sheep in pastoral areas," *Journal of the Department of Agriculture, Western Australia, Series 4*: Vol. 25: No. 1, Article 13.
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Dingoes and sheep in pastoral areas





By P. C. Thomson, Research Officer Gascoyne Research Station

Since 1975, a long-term study of dingoes in the Fortescue River area of northern Western Australia has sought to provide the detailed information necessary to devise efficient dingo management strategies.

Dingoes have been fitted with radio-transmitter collars, then tracked and observed from a specially equipped aircraft. Their movements, breeding, hunting and social behaviour have been monitored in the rugged, spinifex-covered ironstone terrain which represents typical dingo refuge country, and in neighbouring sheep country.

Although the pastoral and agricultural industry have long recognised the need to control dingoes to protect livestock, particularly sheep, there is little published evidence about the type of damage and the extent of losses caused by dingoes.

■ Sheep country in the Fortescue area. In the foreground is one of five sheep killed by a pair of dingoes one night.

Tracking dingoes

The dingo study on stocked pastoral land was carried out on grass plains country on Mardie station, 490 kilometres north of Carnarvon. It lasted from January 1978 to November 1980 and again for a short period in October 1982. During the study, normal dingo control work ceased in the area, although from time to time certain dingoes were killed to prevent sheep losses rising beyond a level that could be accurately monitored.

Some dingoes were captured in sheep country and fitted with radio collars. Nineteen of the 26 radio-collared dingoes monitored amongst sheep had first been captured and tracked in adjacent refuge country, and had subsequently moved into sheep areas. Another 22 dingoes without collars were also studied.

Dingoes moved into sheep country at various times, and individual dingoes were allowed to remain for different lengths of time before being selectively removed. The number of dingoes tracked at any one time varied from one to nine, and the tracking period for each dingo ranged from three to 64 weeks. There were two main periods of intensive work covering a total of 21 months. The remaining time involved only low intensity surveillance.

Of 1740 observations of radio-collared dingoes in sheep country, dingoes were within two kilometres of sheep for only 13 per cent of these observations.

A close watch was kept on all radio-collared dingoes with access to sheep, and at times these dingoes were tracked daily for periods of up to five weeks. Observations were made mainly during the early morning and late evening, the major dingo activity periods.

Aerial sightings of dead or injured sheep were followed by ground investigation. Detailed examinations, including autopsies, were carried out where possible. In 1978, sheep were checked for injuries when they were yarded for shearing.

Results

During the study, the following points became clear:

- Most dingoes in sheep areas attacked sheep, sometimes maiming sheep without killing them.
- Even when not actively harassing sheep, the presence of a dingo in the area could have an adverse influence on sheep distribution and behaviour.
- Dingoes sometimes chased sheep without biting them. This could lead to adverse consequences such as increased mismothering of lambs.
- When dingoes killed sheep, they often left the carcases uneaten.
- Even dingoes which frequently maimed sheep often ate natural prey such as kangaroos.

Intensive monitoring of the 26 radio-collared dingoes roaming in sheep areas showed that 22 of them killed or injured sheep. The exceptions were dingoes which had access to sheep only for short periods. After dingoes arrived in sheep areas it was only a matter of time before they started damaging sheep.

Sheep chasing and harassment

Although many observations were made of dingoes and sheep within 250 metres of each other in open country, it was often impossible to deduce whether either animal was aware of the other's presence. Similarly, of the 59 chases witnessed, it was often not possible to establish which animal ran first. Nevertheless, some general statements can be made.

■ Dingoes prefer to hunt kangaroos and (right) the euro.



Sheep always ran off when dingoes made a threatening run towards them, although sheep still panicked and ran on about half the occasions when dingoes made no threatening run. There were some chases when sheep did not initially flee in panic.

Dingoes easily out-paced sheep. Once a chase had started, the dingo usually ran in and divided the mob. When there was more than one dingo, they seldom chased different sheep. Sometimes dingoes worked together, although frequently one dingo took the lead in a particular chase, with the others playing little or no part.

In 42 of the 59 chases witnessed, dingoes attacked sheep, but in nine of the 42 attacks witnessed, the dingo quickly left that sheep to chase others.

Even when sheep were not injured during chases, mobs or individual sheep were sometimes chased through fences, upsetting stock management practices and occasionally leaving themselves with no access to water. Sheep were sometimes chased from, or merely avoided areas where dingoes were active, which often resulted in sheep not using good grazing areas. While such occurrences may not have added directly to a "carcase count", production losses would be likely.

Further losses would be expected when dingoes harassed ewes with dependent lambs. Ewes ran off wildly, leaving the lambs to keep up as best they could. Mismothering commonly occurs when sheep flocks are disturbed and unweaned lambs are separated from their mothers.

Attacks on sheep

Dingoes generally started their attacks by biting the hind end of the sheep, wounding the rump or hind legs or often, in the case of rams, the scrotum. Of 191 sheep attacked on which assessment was possible, 155 were damaged at the hind end.

During many dingo and sheep encounters, dingoes shifted their attacks from the hind end to other parts of the sheep, often with fatal results. Sheep sometimes sustained only one or two bites to the throat, and died quickly. In contrast, some sheep were badly bitten on just the hind legs and suffered more lingering deaths (Table 1).

It became apparent that the longer-term survival rate of all bitten sheep was poor. A survey of sheep checked for bites during a shearing run showed that only 15 of 6300 sheep shorn had definite dingo bites, rams excluded. This figure seems very low considering the sheep came from areas where dingoes were active and where many freshly injured and killed sheep were being found.

Rams are considered separately because they suffered different injuries to other sheep (39 of the 46 rams attacked suffered scrotal damage),





■ Despite plentiful natural prey, such as red kangaroos (above left) dingoes still kill sheep. The flank of this sheep was torn open, but the rest of the animal was not damaged. (Kangaroo photo: A. G. Wells.)

and because their survival rate from these injuries appeared to be greater.

Rams probably suffer scrotal damage because the relatively bare and accessible scrotum would be easier for a dingo to grasp and keep hold of than a woolly leg, especially when the ram is running. In addition, the defensive behaviour of rams could enhance their chance of rear-end injury, particularly when several dingoes are co-operating in an attack.

No attacks on rams were witnessed, although there were several observations of wethers, heads lowered, confronting dingoes and in some cases butting them as they approached. Rams would probably do likewise.

Rams can survive severe scrotal injuries and some rams castrated by dingoes survived. Of the 28 rams with scrotal damage found at shearing, 16 had old, cleanly healed wounds. The remainder had wounds of varying age and severity, and about half of the animals survived. A ram's survival from scrotal injuries could be influenced by a reduced chance of fly-strike and infection because of the relatively bare scrotal region.

Feeding on the kill

Dingoes did not usually feed on their sheep kills (Table 2). Significant feeding was found on only 35 per cent of carcases, and an average of two kilograms of meat was eaten from 58 carcases. Dingoes make much better use of kangaroo carcases because they usually return to a kill and feed further. It was extremely rare for a dingo to return to a sheep it had killed, even if it had initially fed from it.

In sheep areas dingoes often used the abundant natural food, principally red kangaroos and euros. Although kangaroos are far more difficult for dingoes to catch than sheep, kangaroos were occasionally killed and left virtually

uneaten by dingoes in sheep country, in marked contrast to the behaviour of dingoes in unstocked country.

Variations in dingo behaviour

The large variations in damage caused to sheep reflected the differences in behaviour between individual dingoes, as well as changes in the behaviour of individuals over time. The complex behavioural analyses of why dingoes sometimes chased sheep without attacking them, and why the attacks varied in type and severity, are beyond the scope of this article, although some facts are clear.

Hunger did not appear to motivate many of the chases and attacks. This was evident from observations of dingoes feeding before chasing sheep and from the low incidence of feeding on the kills (Table 2).

Hunger appeared to influence how a dingo killed; 78 per cent of the sheep that were significantly eaten were cleanly killed by bites to the throat. In contrast, only 46 per cent of uneaten sheep were killed by being bitten on the throat.

It is not known what other factors prompted dingoes to chase sheep, although some element of playing behaviour is possibly involved. What did appear to influence the sheep-chasing behaviour of dingoes was both the length of time they were exposed to sheep and their skill in obtaining other food. Prolonged exposure to sheep almost invariably led to general chasing and biting, and some dingoes were particularly damaging.

The only notable exception was a dingo monitored for 12 months in sheep areas; only once was it implicated in harassing a sheep.

Which sheep were attacked?

Dingoes did not appear to seek out any particular type of sheep; their encounters often seemed to have come about by chance rather than by intention. Because dingoes normally singled out a sheep from those that they first encountered in a running mob, those sheep at the rear were the most vulnerable.

Various factors could affect a sheep's speed, including its age, amount of wool growth, stage of pregnancy, presence of injuries and general body condition.

The weakest sheep were not necessarily those which were attacked. Most sheep attacked were strong animals in good condition (Table 3), but the low number of sheep in poor condition may only reflect the proportion of these sheep in the flock.

It is possible, however, that weak sheep in very poor condition might be less vulnerable to attack, because if they fell down or even stopped running, dingoes might by-pass them in favour of running sheep.

Table 1. Site of mortal wounds on 133 sheep attacked by dingoes.

Body area	Occurrence (%)
Throat	56.4
Head/neck	11.3
Forelegs	1.5
Flank	3.7
Hindquarters	15.8
Scrotum[1]	3.0
Multiple	8.3

[1]12% of sheep examined were rams.

Table 2. Estimates of amounts eaten by dingoes from 166 sheep carcases.

Amount eaten (kg)	Occurrence (%)
Nil	39.2
<0.5	25.9
≥0.5	34.9

Table 3. Body condition at time of examination of 183 sheep attacked by dingoes.

Condition	Occurrence (%)
Good	78.7
Average	14.2
Poor[1]	7.1

[1]43% of sheep in this category had old wounds which probably caused their poor condition.

Losses

In discussing the extent of the sheep losses recorded, it is meaningless to present a figure of the sum total of sheep which were killed or wounded by dingoes. A number of factors influenced such a figure, including:

- Dingo numbers varying over time.
- Individual dingo behaviour varying over time, as well as differing behaviour between individuals.
- Sheep availability to dingoes varying over time. Sheep stocking rates varied across the study area, as well as over time (for example when paddocks were cleared during shearing).
- The impossibility of maintaining a constant watch on all dingoes. Inevitably, some dingo/sheep interactions would have been missed.
- The selective removal of particularly damaging dingoes which gave a biased result against the recording of large losses.

Any loss figure based on a "carcase count" does not consider the losses from dingo harassment. Nevertheless, an indication of the extent of direct losses attributable to dingoes is given in Table 4.

These data were obtained during a period of intensive monitoring when no dingoes were removed. At that time, some of the monitored dingoes were particulary active amongst sheep, so the data do not necessarily reflect the "normal" situation, rather they indicate a potential damage situation.

The figures in Table 4 suggest an annual loss of 33 per cent in Area A, and 16 per cent in Area B. These losses, of course, would not be strictly density-dependent. It is most unlikely that halving the number of sheep available to dingoes in Area B would have led to half the number of actual losses; the percentage loss would probably be higher. In fact, in Area B, some mustering took place during the period, and at times dingoes would have had access to far fewer sheep than is indicated in Table 4.

Since there were considerable differences between individual dingoes in their behaviour toward sheep, it is not valid to extract a "loss per dingo" figure. In Area A (Table 4), one particular dingo caused most of the sheep damage. Table 4 lists the maximum number of dingoes present in each area simply because it was not always possible to attribute every sheep carcase in an area to a particular dingo.

There were instances of dingoes causing more extensive sheep losses over a shorter time period. On one occasion two dingoes killed five sheep in a single sequence of activity. On another occasion, five dingoes killed at least 17 sheep over a five-day period. In contrast, there were times when little damage was recorded.

It is not known whether regional differences could influence the amount of damage caused by dingoes to sheep, although type of prey and abundance could be an important consideration. In sheep areas where dingoes had no abundant alternative prey, damage could be more prevalent than in the present study. However, lack of alternative food may only be reflected in better use of sheep carcases by dingoes.

Without dingo control, any sheep flock in dingo country would suffer losses. Losses of the magnitude found in this study, coupled with other losses due to dingo harassment, would seriously affect the viability of a sheep raising enterprise.

Acknowledgments

The Agriculture Protection Board is extremely grateful to Mr Ben Sharpe, formerly of Mardie station, for his generous assistance and co-operation which allowed this study to be undertaken. Many thanks are also due to Mr Phil Backman, present owner of Mardie, for continued support during the latter part of the study.

Table 4. Example of sheep losses brought about by different dingoes operating in different areas (A and B) over an 18-day period (June 20 to July 7, 1978).

	Area A	Area B
Dingoes involved[1]	3	6
Potential sheep available	800	4 200
Harassments, no injuries[2]	5	3
Minor injuries[3]	1	3
Kills/mortal injuries	13	26
Other verified losses	0	7[4]
Total identifiable losses	17[5]	33

[1]Maximum number of radio-collared and uncollared dingoes in each area.

[2]Includes sheep being pushed through or against fences, or other non-contact chases.

[3]These sheep were deemed survivors; whether they survived or not is unknown.

[4]These were rams which although they may have survived were deemed to be losses by the producer because of scrotal damage.

[5]Includes four sheep which were killed in adjacent paddocks, and were not from the 800 sheep listed as potentially available.