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The use of buffer zones in dingo control

The aim of dingo control is to protect livestock, not to eliminate dingoes from Australia's vast uninhabited areas. However, with labour costs rising, dingo control must become more cost effective.

*In this article, **P. C. Thomson** discusses the "buffer zone" control strategy which involves removing dingoes from a strip of country adjacent to stocked land.*

Although variations of this general strategy have existed for some time, detailed knowledge of dingo behaviour and movement patterns was required to ensure that the concept was soundly based. Much of this information came from a long-term study of dingoes carried out in unstocked country and adjacent sheep paddocks in the Fortescue River area of Western Australia. Some preliminary results of the buffer zone control method are also presented.

■ Trapping a dingo in the Fortescue area to fit a radio-collar.



Control in stocked country versus adjacent areas

The suggestion that livestock can be protected by controlling dingoes only within stock boundaries was rejected on the basis of the Fortescue work because:

- Stock could sustain considerable damage before dingoes were killed, particularly in view of the large proportion of individual dingoes which damage stock (see previous story on "Dingoes and sheep in pastoral areas").
- In the Fortescue area at least, it is harder to control dingoes in sheep country than in unstocked land. In sheep areas dingoes tend to use a larger proportion of their range, probably because of numerous sheep pads and regularly spaced and reliable water. In addition people can disturb dingoes. Dingoes in sheep country therefore rarely have the regular and more restrictive travelling routes which are commonly used in unstocked land.

Dingo control methods such as trapping and baiting are carried out mainly along these travelling routes. Unless more control points are created in sheep country, there would be reduced probability of a dingo quickly coming into contact with a control measure. Since there are practical limits to the number of control points possible, considerable time can elapse before dingoes are removed from sheep paddocks. Moreover, the abundant food (sheep and native prey, see table) which is normally available in sheep areas reduces the likelihood of successful baiting.

- The control effort would have to be a continuous one as any lapse would allow invading dingoes to become established in sheep areas and cause stock losses.

Clearly, it would be more efficient to prevent dingoes from reaching stocked country. This can be achieved either by erecting a physical barrier to dingo movement (which is not feasible in many rangeland areas of Australia), or by killing dingoes before they reach stock. How far must control work extend away from the boundary of stocked land?

Dingo territory and dispersal

Dingoes at the Fortescue study site are organised into family groups which occupy discrete territories 10 to 15 kilometres wide. Resident dingoes repel intruding dingoes which try to settle in established territories.

Individual dingoes sometimes make dispersal moves away from their home territories, apparently because of social pressures within the group or insufficient food.

Since dingoes cannot become successfully established in another group's territory, a dispersing dingo can only survive if it finds an area where there is enough food, water and shelter but no resident dingoes. Four of the radio-collared dingoes in this study died as a result of moving into other territories; they were either killed by the residents or forced into what appeared to be poorer fringe sections of territories.

Eight radio-collared dingoes moved rapidly through established territories to reach dingo-free country and 21 dingoes moved directly into unoccupied areas. Of these 29 dingoes which reached vacant country, only three died naturally. This survival rate may be higher than expected because most of the dingoes settled in sheep country with plentiful food.

Dingoes which dispersed settled down once they reached suitable vacant areas. The distance a dingo travels from its home territory determines whether it has the potential to reach stocked country.

In the Fortescue area 39 of the 46 radio-collared dingoes which dispersed travelled less than 20 km, measured as a straight line, from the edge

of their former territories to new areas. Limited information is available on 13 of these 46 dingoes so they were excluded from the earlier survival results. Slightly longer moves may have been recorded for several dingoes which were shot or run-over by cars during their dispersal moves but were close to vacant country when killed. The 27 radio-collared dingoes which reached sheep areas travelled an average of 7 km (range 1 to 27 km).

Long distance moves were rare. Only three dingoes travelled between 30 and 50 km and one travelled 150 km to unoccupied territory. This finding might be expected as much of the country, with the exception of sheep areas, was occupied by dingoes. It is unlikely that a dingo could survive a long journey through a number of dingo territories and then find a suitable vacant area to occupy.

The buffer zone concept

Dingoes found in sheep areas either have this country as part of their territory, or they have moved into it from further outside stocked country. The findings outlined suggest that controlling dingoes within a strip of country 15 to 20 km from the stock boundary should remove most of the dingoes likely to threaten sheep. Such a strip of country would act as a buffer to the movement of dingoes towards stock.

In this buffer zone, dingoes entering from further outside the zone would be likely to settle rather than keep moving. They would not be harassed by resident dingoes and would have adequate resources. These resources had originally supported one to two former dingo territories within the width of the zone.

A concentrated control effort in a limited area is more efficient than a less intensive, haphazard effort over a wide area; efficient control work should allow the buffer zone to be virtually cleared of dingoes. Once dingo numbers have been reduced, less control effort should be necessary to remove any dingoes which invade the buffer zone.

Testing the strategy

A simulated buffer zone 15 to 20 km wide and adjoining the sheep country boundary was established at the Fortescue study area. Aerial baiting trials conducted throughout this zone in 1980 had almost cleared it of dingoes. In one section where there had been at least 34 dingoes before the trials, only one or two dingoes survived.

No more control work was carried out in the buffer zone, although in late 1981 there was a control trial in country beyond the buffer zone, further away from sheep country. Dingo numbers were reduced in some areas, although many dingoes remained. These provided the

Transect counts of red kangaroos and euros, Fortescue River.

Averaged over the six days of counts from June 1981 and 1982.

	Kangaroos (per km)	Transect length (km)
Sheep country	1.6	18.5
Unstocked country	0.2	25

source for the continuing re-establishment of dingoes in the buffer zone.

Over a four year period before clearing the buffer zone, at least 40 radio-collared and uncollared dingoes dispersed into sheep country. After the buffer zone was set up, prey numbers built up in the zone, and dingo groups slowly became established. No incursions were made into sheep country for several years.

By late 1982 however the buffer zone was again occupied by resident dingoes, which meant that any dingoes moving in from further out could not settle in this area. At this time, the first dingo in over two years moved across the buffer zone and reached sheep country. At least two more dingoes have since followed.

These findings support the concept of a buffer zone. They also indicate that lapses in the dingo control effort do not necessarily create an immediate threat to livestock. The relatively long period that elapsed before dingoes moved into sheep country is probably exceptional.

However, one dingo group established a territory in the buffer zone which spanned a greater width of country than normally recorded; had this territory been orientated differently, these dingoes could have entered sheep country only about one year after the buffer zone was cleared.

A continuing low intensity control effort should be maintained in the buffer zone and this would be especially important if many dingoes suddenly moved into it.

A broader view

Although the buffer zone concept should apply in other regions of Australia, differences in the social stability, territory size and movement patterns of dingoes could affect its required width.

A second study area has been established on the Nullarbor Plain. This new area differs markedly from the Fortescue area in terrain, seasonal conditions, water distribution, prey type and prey population fluctuations. It is expected that from work done in these contrasting areas, dingo control strategies will emerge that will be applicable to a wide range of situations.