

Magpie Goose Populations on the Coastal Plains of the Northern Territory (1958-1980)

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Results of surveys of Magpie Geese on the coastal plains of the Northern Territory are reported for the period 1958 to 1980. Numbers declined markedly from 1958 to 1971, but recovered during the following years.

Frith and Davies (1961) made 28 surveys from fixed-wing aircraft of populations of Magpie Geese *Anseranas semipalmata* on the coastal plains of the Northern Territory between Darwin and Oenpelli during 1955-58. They estimated that the population totalled 350 000.

They found that as the coastal swamps dried up at the height of the dry season geese concentrated in such places as Lake Finnis on the Adelaide River east plains, various channels of the Mary River, Bamaroogjaja on the South Alligator River and on inland waters up to 300 km from the coast.

The present study records population numbers on the plains (in the areas surveyed by Frith and Davies) from 1958 to 1975 and in 1980.

Methods

The main study areas were the coastal plains associated with the following rivers: Howard, Adelaide, Mary, Wildman and the three Alligators, West, South and East (Fig. 1). Magpie Geese were counted from a high-wing aeroplane, flying at a height of 150 metres and at a speed of 90 knots. Two experienced observers sat on either side of the aircraft and recorded numbers of geese in quanta of 1, 10 or 100 depending on their density. Counts were made between 06:30 and 12:00 hours over one to three days before early wet season rains dispersed the birds. It should be stressed that the figures obtained are estimates but it is believed that they are constant and reliable enough to serve as an index of the populations surveyed.

The same transects were covered each year that counts were made; that is, in early October, 1959, early October 1960, and then in late September from 1961 to 1975 and in late September 1980. This method of estimating goose numbers is comparable with that used by Frith and Davies; one of us (DGT) accompanied them on several flights in 1958, thereby obtaining familiarity with their methods and study areas; their techniques were used on each occasion.

Results

Figure 2 shows that estimates of the numbers of geese during 1958-1980 declined quite sharply from about 350 000 in 1958 to about 50 000 in 1971. In 1972 numbers started to increase and in 1974 there were 175 000 birds and in 1980, 382 000, a figure similar to the 1958 count of Frith and Davies. Table 1 shows a large concentration of geese on the South Alligator River in 1980; there were almost 200 000 birds on one swamp.

Discussion

The number of Magpie Geese declined steadily over 15 years and then increased within eight years to a level comparable with that at the beginning of the study. Although the population changes are real, we are at a loss to give a logical explanation. Some or all of a number of factors may be involved.

(i) *Damage caused to feeding and nesting areas of Magpie Geese by Water Buffalo.*

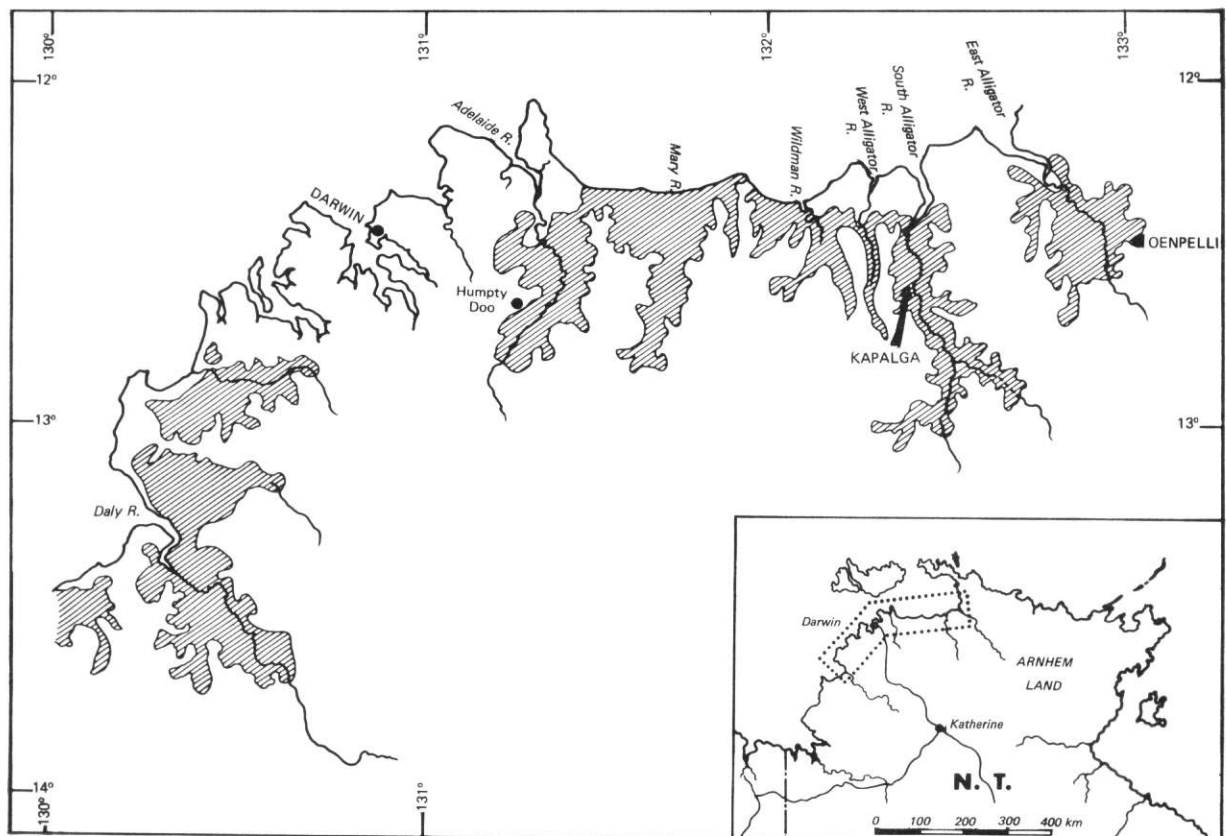
It has been postulated (R. E. Fox and others, pers. comm.) that Water Buffalo *Bubalus bubalis* have made deep tracks in many areas, thus causing early or premature draining of the plains. This has slowly reduced the areas suitable for egg-laying. However, we have not seen any data which confirm this.

For the past four years we have studied breeding colonies of geese in an area where buffalo are abundant. Of about 500 nests studied only two were known to have been physically destroyed by buffalo.

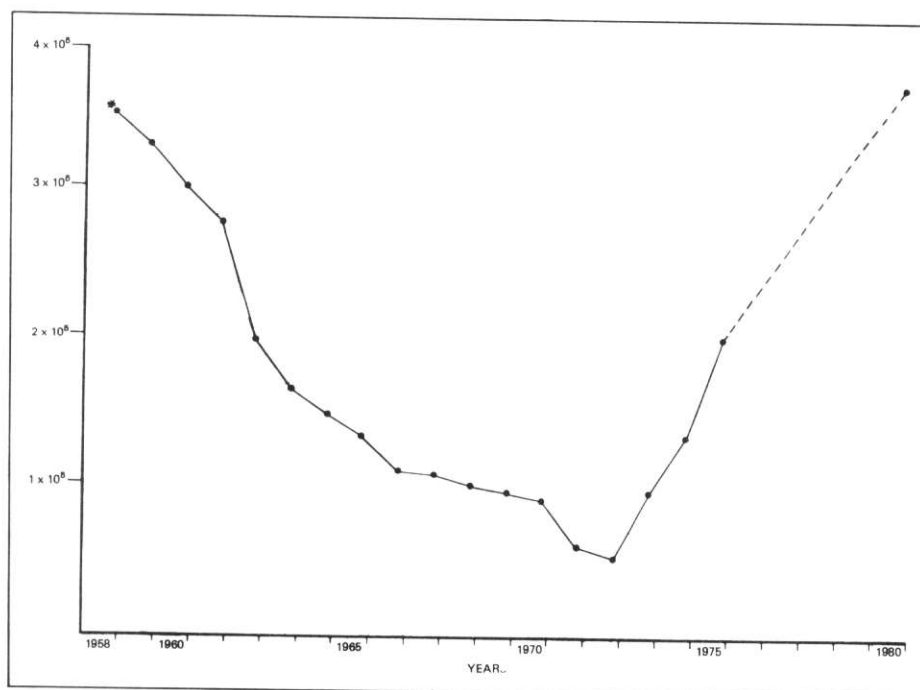
TABLE 1

Estimates of the numbers of Magpie Geese on the various River Systems in 1972 and 1980.

Location (River System)	Number of Geese	
	1972	1980
Howard River	4 210	450
Adelaide River	10 500	15 210
Mary River	16 580	3 950
Wildman River	4 450	15 100
West Alligator River	1 600	Nil
South Alligator River	9 150	313 930
East Alligator River	3 940	31 870
TOTAL	50 430	380 510



● Figure 1. Location map of the areas surveyed. The shaded areas are the Coastal Plains referred to in the text. The map is adapted from that of Frith and Davies (1961).



● Figure 2. Total number of geese counted each year between 1958 and 1975 and in 1980. The 1958 count is that of Frith and Davies (1961).

(ii) *Damage caused to habitat by grass fires extending over wide areas.*

In 1961, widespread and intense fires destroyed much of the herbage in the Darwin-Oenpelli area including the plains (total area approximately 30 to 40 000 sq km). Burning commenced in early September and continued until almost all of the herbage was destroyed (Tulloch 1975). These widespread and intense fires occur only during exceptionally dry years.

The areas burnt in 1961 included a great deal of plains country not burnt for many years. Additionally, the 1961 dry season was exceptionally long (Tulloch 1978) and swamps which normally contained water at the end of the dry season dried up, resulting in reduced food supply for the geese. The major food available in late November was bulbs of the spikerush *Eleocharis* sp; many birds were in poor condition and appeared too weak to dig for these bulbs. At the time it was a common sight to see large

numbers of geese in a very emaciated condition lying round the edge of dried-up swamps. Most of the geese subsequently died. Counts made by one of us (DGT) suggested that over 10 000 geese perished as a result of starvation in 1961.

(iii) *Predation of eggs by man.*

It can be assumed that aborigines have been harvesting goose eggs for many years and therefore should have no adverse affect on the goose population. But somewhere about 1958-59 Magpie Goose eggs became a saleable commodity and thus the situation changed somewhat. No longer were the aborigines harvesting eggs solely for their own use but they were offering them for sale. Eggs were sold at one store in Darwin for one shilling each. In 1972, 20 000 goose eggs were offered for sale at Bagot Aboriginal Settlement, Darwin. The Wildlife Conservation and Control Ordinance of 1962-66 prohibited this "over the counter" trade, but the Ordinance was not policed due to limitations

of staffing. The policing of the Ordinance increased from the early 1970's onwards; this slowly reduced and has hopefully eliminated this illegal trade in goose eggs.

(iv) *Irregularity of the "wet" season and consequent major variations in the extent and depth of flooding on the coastal plains.*

In the area being considered in this paper the regularity of rainfall is high (Tulloch 1967), but when there is no monsoon the rainfall is well below average (about 1 500 mm). As a consequence, depth of water varies considerably from year to year (Table 2, a,b,c); this phenomenon is referred to elsewhere (Tulloch, 1967). The areas referred to in Table 2 are the Adelaide River west plains, the Mary River plains and Swim Creek plain — all traditional Magpie Goose breeding areas (Frith and Davies 1961). As an example of the variability of rainfall, the year 1959 was characterised by an unusually late cyclone in April, during which 304 mm of rain fell, and for the second time that year the plains flooded (Frith and Davies 1961).

Frith (1968) found that in some years when the swamps were not well filled and dried early, very few, if any, young survived to fly.

It is relevant to mention that the 1981-82 wet season was quite prolonged and the goose-laying activities at Kapalga, on the western plains of the South Alligator River (the CSIRO Study area), were more extensive than in the previous five years.

(v) *Number hunted annually.*

Hunting pressure may vary from year to year; we can find no data on this, but it could be an important factor. The issue of licences may be an indication of shooting pressures.

(vi) *General.*

It could possibly be argued that the decline in goose numbers which occurred over the first 15 years of the study could have been due to birds moving away from the study area. If they did move away, where did they go? Information supplied by missions and stations or settlements on the Arnhem land coast, e.g. Maningrida, Milingimbi and Nhulunbuy did not suggest any large increase in the Magpie Goose population

TABLE 2(a)

Adelaide River west plains, 1965-76. Maximum depth (metres) and duration of flooding (months) for depths 0.99 m and 1.3 m measured on an automatic depth-measuring gauge by what was, at the time, the Stream Gauging Section of the Water Resources Branch, Northern Territory Administration.*

Year	Maximum Water Depth (m)	Months of inundation at a gauge height of:	
		.99 m	1.3 m
65-66	1.369	4.4	2
66-67	1.299	2	0.1
67-68	1.598	6.1	3.5
68-69	1.748	4.7	2.1
69-70	1.211	3.5	—
70-71	1.437	6.6	0.87
71-72	1.448	6	1.5
72-73	1.373	5	1
73-74	1.601	5.6	3
74-75	1.601	7	4.4
75-76	1.720	7	3.5

TABLE 2(b)

Mary River Plains, 1966-70. Maximum depth (metres) and duration of flooding (months) for depth of 1.219 m and 1.520 m.

Year	Maximum Water Depth (m)	Months of inundation at a gauge height of:	
		1.219 m	1.520 m
66-67	2.168	2.25	1.5
67-68	2.322	2.1	1.7
68-69	2.329	2.1	0.8
69-70	1.41	1.25	—

TABLE 2(c)

Swim Creek Plain 1964-67. Maximum depth (metres) and duration of flooding (months) for depths >0.305 m and >0.457 m.

Year	Maximum Water Depth (m)	Months of inundation at a gauge height of:	
		>0.305 m	>0.457 m
64-65	1.138	8	5
65-66	0.933	6	4
66-67	0.787	5	3.7

* This organisation is now referred to as the Water Division, Department of Transport and Works, N.T. Government.

in these areas. Nor were any large increases reported inland (managers of Beetaloo and New-castle Waters Stations, pers comm.) Only 10 000 geese were counted between Darwin and the Daly River area in 1980. Ground surveys in this area over the years 1960-75 indicate that relatively few geese use this area during the dry season. Beeton (1977) reported the presence of up to 20 000 geese in the Ord River Valley in 1973 and it is possible that some or all of these geese were from the study area. But even this does not account for the large numbers of geese not sighted.

Acknowledgements

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