ARTICLES

HOMING ABILITY OF THE SOUTH AFRICAN CLIFF SWALLOW

Roy Earlé

Some swallow species are known for their remarkable ability to return to their nests and nest sites used in previous years. However the ability of swallows to 'home' during their breeding season has not been investigated in southern Africa. The South African Cliff Swallow *Hirundo spilodera* occurs in large colonies which often offers the opportunity of trapping large numbers, thus making displacement experiments with a good sample size fairly easy.

A series of experiments to test the ability of South African Cliff Swallows to return to their breeding colony was carried out during two breeding seasons (1983/1984 and 1985/1986) at three colonies around Bloemfontein. The three colonies were selected as they could easily be trapped and yielded a nearly 100 % trap success with very few birds escaping (see Earlé 1984 for details of trapping method). In the 1983/1984 season 121 birds from two different colonies were trapped and released at distances of up to 48 km from the trapping site. In the 1985/1986 season 483 birds from a single colony were used in the experiments. These birds were released at distances of 10, 50 or 100 km from the colony in each of the four compass directions. Groups of between 30 and 45 individuals were released at these points and the colony was trapped again seven days later to determine the number of displaced birds in the colony. All groups consisted of a mixture of males and females as well as adult and first-year birds. All birds which were ringed in previous seasons were taken as adult while individuals trapped for the first time during the release experiments were assumed to be first-year birds. There is very little intercolony movement of adults, while juvenile birds seldom stay in their hatching colonies (unpublished data) and it is thus probably safe to assume that these unringed birds appearing in the well-ringed colonies each year are birds that fledged in other colonies in the previous breeding season. In the 1983/1984 experiments I did not distinguish between adult and first-year birds.

RESULTS

The 1983/1984 experiments

The results of the three experiments undertaken in the 1983/1984 season are shown in Table 1 (overleaf). There was no indication of how quickly the homing birds returned to their original

TABLE 1

HOMING ABILITY OF CLIFF SWALLOWS IN SOME EXPERIMENTS IN THE 1983/1984 SEASON

Colony	Release Point	Number Released	Number Retrapped	% Returned	Distance (km)
Fortuin	Bloemfontein City	21	13	62	48
Schoongezicht	Bloemfontein City	50	32*	64	35
Schoongezicht	The Willows	50	31	62	12
TOTAL		121	76	62,8	

* This number excludes three birds retrapped at other colonies

colonies but it is unlikely that the individuals would not have reached their colony within the week to the next trapping effort. A remarkably similar percentage of birds returned to their colonies and except for the three found at different colonies (Table 1) there was no indication of what happened to the birds that did not return. It is interesting to note that the birds released at a different colony were never retrapped at that colony. There was also no indication that either males or females had a higher return rate. Of the 121 birds released, 55 each were males and females and 11 were of unknown sex. Of these, 34 (61,8 %) of the males, 35 (63,6 %) of the females and 6 (54,5 %) of the unsexed birds returned.

The 1985/1986 experiments

The results of the experiments are given in Table 2 (overleaf). It seems as if the birds released closest to the colony had the highest return rate in both the adult and first-year classes, except for the adults released to the east, which showed a reverse pattern (Table 2). There were significant differences between the number of adult and first-year birds returning from all distances and all directions ($P<0,05$) except for the 10 km E release point ($P=0,49$). The overall return rate of 56,3 % is slightly lower than that of the experiment in 1983/1984 but the 63,7 % of adults alone is remarkably similar to that of 1983/1984 (62,8 %). Again there was no indication that either males or females had a higher return rate. Of the 483 individuals released, 163 were males, 181 females and 139 were unsexed. Of these, 93 (57,1 %) of the males, 107 (59,1 %) of the females and 72 (51,8 %) of the unsexed birds returned. These figures are slightly lower than those for the 1983/1984 experiment.

DISCUSSION

The homing ability of swallows has been investigated largely in northern America. There seems to be good evidence that all the species studied have a reasonable ability to home. A total of 16 Purple Martins *Progne subis* displaced by Southern (1959) at distances of 2,8 to 376 km all returned to their nests, while European Swallows *Hirundo rustica* displaced at distances of 276 to 1 875 km from their nests showed a return rate of 40 % (Rüppell 1934). The homing ability of the European Swallows, however, decreased steadily with increasing distance. Indications of a similar trend were found in the Cliff Swallow. For distances of up to 96 km, Nastase (1982) found that between 66 % and 41 % of released European Swallows returned. He observed that males and females had equal homing abilities, which he attributed to the important post-copulatory rôle played by the male, e.g. feeding of young and nest defence. Matthews (1955) reported a homing rate of 37 % of European Sand Martins *Riparia riparia* while Sargent (1962) had return percentages of between 33 % and 80 % depending on the displacement distance. In this study the 62,8 % and 56,3 % birds respectively homing is

TABLE 2

SUMMARY OF NUMBERS OF SOUTH AFRICAN CLIFF SWALLOWS DISPLACED AT VARIOUS DISTANCES AND DIRECTIONS FROM 'THE WILLOWS' COLONY, TOGETHER WITH THE NUMBERS HOMING SUCCESSFULLY

GROUP	RELEASE POINT	NUMBER OF ADULT* BIRDS			NUMBER OF FIRST-YEAR** BIRDS			TOTAL NUMBER OF BIRDS		
		RELEASE	RETRAP	%	RELEASE	RETRAP	%	RELEASE	RETRAP	%
A	10 km N	33	25	75,8	12	5	41,7	45	30	66,7
F	50 km N	33	26	78,8	12	4	33,3	45	30	66,7
B	100 km N	34	18	52,9	11	1	9,1	45	19	42,2
E	10 km E	30	17	56,7	10	5	50,0	40	22	55,0
C	50 km E	35	22	62,9	10	4	40,0	45	26	57,8
D	100 km E	36	25	69,4	9	3	33,3	45	28	62,2
D1	10 km S	30	21	70,0	8	3	37,5	38	24	63,2
E1	50 km S	26	17	65,4	10	3	30,0	36	20	55,6
F1	100 km S	24	11	45,8	6	1	16,7	30	12	40,0
A1	10 km W	22	16	72,2	16	8	50,0	38	24	63,2
B1	50 km W	28	18	64,3	10	4	40,0	38	22	57,9
C1	100 km W	30	14	46,7	8	1	12,5	38	15	39,5
TOTAL		361	230	63,7	122	42	34,4	483	272	56,3

* 'Adult' birds were individuals ringed in a season prior to the season in which the experiment was conducted.

** 'First-year' birds were first ringed on the day of the experiment. See text for the explanation of why these birds were assumed to be first-year birds.

very close to the 58 % obtained by Mayhew (1958) for 143 American Cliff Swallows *H. pyrrhonota* released at distances of 64 to 184 km.

As there is some evidence that displaced birds can join other colonies (Table 1), it is quite possible that these 'lost' birds have joined colonies where no ringing took place. No displaced birds released at a colony were ever found at the release colony, indicating that there is probably an 'instinct' to home rather than just join any colony. This was also found to be the case with the American Cliff Swallow (Mayhew 1958). There is no apparent difference between the homing ability of males and females in the South African Cliff Swallow which can probably, as in the case of the European Swallow (Nastase 1982), be explained by the near equal rôles played by both sexes in breeding (Earlé 1986).

ACKNOWLEDGEMENTS

I am grateful to Kotie Herholdt, Hester du Toit, Ben Bester and the scores of other helpers for the trapping and ringing of the swallows.

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R.A. Earlé, National Museum, P.O. Box 266, BLOEMFONTTEIN, 9300