

Loch Leven, 1968

The intensity of nest searching on St. Serf's Island was reduced to a level sufficient to detect seasonal changes in egg size, clutch size and hatching success. In all, nests of 363 Mallard, 192 Tufted Duck, 31 Gadwall, 23 Wigeon, 5 Shoveler and a Teal were marked and checked. Clutch size was determined for those clutches with at least two records of the maximum clutch size and no inconsistencies such as egg loss whilst the clutch was being laid (Table I). In both species the clutch size was found to decline through the season in all three years. This may well be an age effect, the younger less prolific birds laying later. It will take some years of ringing to see whether this or some other factor is the cause. Measurements were taken of several hundred eggs, since in several species egg size has been found to increase with age, providing another check on the hypothesis. The mean clutch sizes showed no significant difference between the years, the lower figure for Mallard in 1966 probably being due to the late start in nest-searching that season.

Table I. Clutch size of Mallard and Tufted Duck, 1966-68.

Year	No.	Clutch size Mean	s.e.
Mallard			
1966	126	8.16	0.18
1967	181	8.58	0.25
1968	109	9.00	0.17
Tufted Duck			
1966	118	9.51	0.27
1967	158	9.49	0.25
1968	165	9.69	0.18

Of 103 Mallard nests 66% hatched (cf. 49% and 78% in the previous years), while of 126 Tufted 71% hatched (cf. 53% and 40%). The season was an unusually fine one in Scotland. Other factors which might have contributed to the good success could be the lower intensity of nest-searching and changes in the degree to which the fledging of Jackdaws, one of the main egg predators, coincided with the peak of egg laying. Several more seasons are needed to check such correlations. Once again it was found that better hatching success was achieved in those nests situated in or near the massive gullery on the island. Both species showed preference for nesting in association with gulls, this being less marked in the case of Mallard, many of which start to lay before the gulls.

Two attempts were made to measure the extent to which nest searching and marking might increase predation. A 50 m. square in the *Deschampsia* zone was kept free of visits from early in the season; and a series of false nests was made up with hens' eggs, some marked with canes in the usual way, some unmarked. Neither test was wholly conclusive and both will need repeating, but the indications were that no very great increase in predation resulted from our normal activities.

After the nesting season 30 transects two metres wide were closely searched through the various nesting zones. The nests then found, compared with those marked by flushing visits once a week in each area, give an estimate of the total nests (including re-nests) on the island. For Mallard the calculation gave 391 and for Tufted Duck 452. The latter accorded closely with counts of 468 females on the Loch early in May just before the main nesting of this species. This suggests that most females of this species do lay in their first year. Previously there were suggestions that they did not breed until more than two years old, i.e. in their third summer. The point is clearly an important one in the understanding of population dynamics and must be further investigated.

Catching females on the nest with hand nets continued successfully. Including recaptures from previous years, 111 Mallard, 82 Tufted Duck, 11 Gadwall, 7 Wigeon and 8 Shoveler were caught in this way. The precise location of their nests were determined by distance and bearing from the posts of the permanent grid of 50 metre squares. This will enable interesting data to be gathered on the preciseness with which duck return to the nesting area in following years.

Much time and energy went into attempts to fill one of the main gaps in the study, the extent to which hatched ducklings survived to fledging. The marking of young with coloured tags would necessitate frequent visits to the island to catch them in the short interval between hatching and leaving the nest. This would create too much disturbance. The females caught on their nests were marked with conspicuous wing tags, in the hope that the broods could be identified from the accompanying adult. But the broods split up or amalgamated and different females left their young at different stages. The only remaining method

was to assess post-hatching mortality by the declining numbers of young in the later stages of development. Even this did not give satisfactory results.

More definitely it is known that 218 Tufted at the very minimum reached fledging, for this is the number caught in the diving duck traps erected in the shallow waters of the loch. Undoubtedly the true figure is higher, but, even with

the outstandingly good weather of 1968, Loch Leven would appear not to be a good place for duckling rearing, however good the nesting conditions are on St. Serf's. Many young Tufted Ducks were captured more than once and the changes in weight and wing length are being analysed in relation to those reared at Slimbridge by Dr. Kear from the 80 near-hatching eggs taken from St. Serf's.

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