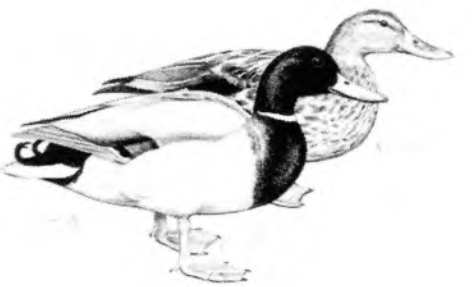
Reforming of resident Mallard pairs *Anas platyrhynchos*, rule rather than exception?



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The Mallard *Anas platyrhynchos* is one of the best studied waterfowl species in the world, and its ecology is well known. Several studies have in the last decade focused upon its pair formation and mating strategy (e.g. Burns *et al.* 1980, Williams 1983, Bossema & Roemers 1985). Few studies have, to our knowledge, considered to what extent reforming pairs is common. Weidmann (1956), Lebret (1961) and Raitasuo (1964) say that Mallards may repair with their old mate in sedentary populations, and this may also be found in migratory populations (Dwyer *et al.* 1973). However, these records are mostly based on impressions and real evidence is scarce.

During a time-budget study in 1985 and 1986 in Asane, Western Norway, a total of 172 Mallards (92 males and 80 females) was trapped and marked individually with colour-rings (Mjelstad & Sætersdal 1988). The population has been monitored from 1985 to 1989 and consists mainly of resident birds with a breeding population averaging 100-120 pairs. This is an urban population in the sense that they regularly visit parks during winter and are, based on ringing recoveries, only exposed to shooting exceptionally.

In the period 1985 to 1989, 12 pairs in which both birds were colour-marked have been recorded. Of these we have data from nine pairs where a total of 12 options between remating and mate change exist (Table 1). Two pairs did change mates. In one of these pairs, the female chose another male while the previous male was still in the area. The male of the other pair disappeared and was never seen again.

Table 1. Mate change in Mallard pairs.

	Marked pairs *n*	Pair reformed	Mate changed
1986	5	3	2
1987	4	4	0
1988	3	3	0
Total	12	10	2

The remaining seven pairs all reformed the bond with the old mate: five pairs for a further year, one pair for two years and one pair for three more years. Thus, in ten out of 12 options (84%) the pair bond was reformed in subsequent years. Given random mating in this population of approximately 110 breeding pairs, the expected number of rematings in subsequent years would be less than one (<1%). The advantages of reforming a pair bond could be many: the mates have experience of breeding grounds, conspecifics, predators and feeding places.

Breeding success has been found to increase with the duration of the pair bond in Atlantic Gannets *Sula bassana* (Nelson 1966) and Northern Fulmars *Fulmarus glacialis* (Ollason & Dunnet 1978). From the females' point of view, an old male who is dominant over young males may ensure undisturbed feeding during pre-laying and egg-laying (Mjelstad & Sætersdal 1988), thus maximising clutch size and reproductive success. The males may, by remating with an old and experienced female, benefit from the greater experience that she will have when incubating and raising their offspring (Rowley 1983). In addition, egg size and clutch size are known to increase with age (Mills 1979, Bryant 1989); this may also benefit males who preferentially select females of known old age.

Reforming does not prevent the males having a mixed reproductive strategy (MRS) (Trivers 1972, McKinney *et al.* 1983, McKinney *et al.* 1984). Paired males and females do participate in social display and this has been discussed by McKinney (1975), McKinney & Stolen (1982) and Bossema & Roemers (1985) who concluded that males can form extra-marital bonds or liaisons with other females and thus have the opportunity for a MRS or mate change if necessary. The females for their part can defend, strengthen and test the pair bond. Our findings suggest that reforming of Mallard pairs is, at least in resident populations, more common than earlier stated.

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