

The Ural mountains are not a home for ducks, but the lower Ob basin to the east, which still remains to be considered, is perhaps the most important area of all. Unfortunately it is also the most difficult one about which to make predictions. The country is grim for human settlement, and western geographers have written little about its potentialities, but recent Russian maps indicate that settlements are increasing rapidly. The density of recoveries of British-ringed ducks, though still low absolutely, is relatively higher than for any other breeding area. Although the lower Ob is described by Russian ornithologists as an important gathering ground for moulting ducks, the recoveries have nearly all been made in May and early June. This suggests that the beginning of the summer, when the ducks are newly arrived and the human inhabitants are first able to move about after the break-up, is a hazardous time. Until more is known of the growth of the human population of the Ob basin it is difficult to guess whether conditions there will deteriorate in the next few years.

As has already been emphasised, this is no more than a sketch for a picture of north-west Russia as a home for ducks. Very much more work will have to be done in determining the needs of nesting ducks as well as in collecting information about human activities in Russia and Scandinavia before reliable estimates of the status and prospects of the populations of various species can be achieved. But in the author's opinion the human development of north-west Russia is not likely to produce catastrophic changes in the duck population in the foreseeable future. The ducks visiting Britain in winter seem to be in far greater danger from their reception in western Europe than from the hazards of living in Russia.



THE USE OF HAND-REARED DUCKS FOR SUPPLEMENTING WILD POPULATIONS

By Hugh Boyd

HAND-REARING of ducks for shooting has long been practised in Britain. Until recently such rearing was undertaken only by landowners, or their tenants, for their own immediate benefit. In the last two years the Wildfowler's Association of Great Britain and Ireland has been advocating the rearing of ducks for release in the wild by its members, individually or collectively, and some of its local organisations put such schemes into practice in 1955. The novelty and interest of these schemes lies in the fact that few of the members of W.A.G.B.I. are landowners, and the majority are probably only able to indulge in fowling on the foreshore. Two lines of inquiry suggest themselves. First, will duck-rearing schemes improve the sport of members of W.A.G.B.I.? Second, will such schemes 'in due course do much to increase our wildfowl populations' as the Annual Report of their Association for 1953-54 suggests? The two questions are related, though by no means identical. This discussion of them is based on a number of papers published in America in the last 20 years dealing with similar problems, analyses by the writer of the results of British Mallard ringing (see Boyd 1954, but largely unpublished), and various observations on the behaviour of ducks and wildfowlers.

The improvement of fowling, at least for those who call themselves wild-fowlers (though not for those who simply want to kill ducks and geese), does not only involve the provision of larger numbers of fowl. The birds must also be wild, so as to be difficult (though not too difficult) to shoot. Thus, to return an affirmative answer to the first question it is necessary to demonstrate that the release of hand-reared ducks will increase the numbers of wild ducks frequenting the shore. The relevant evidence is of various kinds, but of nearly unanimous import: it seems unlikely that hand-reared ducks can improve shooting on the foreshore. The reasons may conveniently be classified under the heads of rearing, release and replacement.

Rearing

There are two main difficulties in rearing: obtaining supplies of eggs, and rearing for wildness. The technique of rearing as such is not difficult (see *July 1947*). The only eggs obtainable in any numbers are those of the Mallard. This is unfortunate because it is difficult (Professor Konrad Lorenz says impossible) to find any Mallard population in Britain or western Europe wholly free from an admixture of domesticated or 'call duck' blood. The eggs supplied by game farms inevitably contain a very high proportion of such stock. Their



faults from the wildfowler's point of view are obvious enough. They are too tame and usually poor flyers. Ducklings reared from wild-taken eggs are comparatively unlikely to suffer from these faults, but the taking of eggs from wild ducks' nests is only justified if the number of ducks reared to fledging is higher as a result than would have been the case if the Mallard duck had been left to hatch and rear her brood. If the eggs are taken early in the season this hope may be fulfilled, since it is then probable that the duck will re-nest so that the survivors of her second brood may be added to the captive-reared birds in counting the yield.

Perhaps largely because of the existence of heritable differences, the effects of hand rearing on the tameness of ducks after release are arguable. My own view is that, even if artificial rearing has led to the attachment of young ducklings to the person looking after them, the free-flying adults released in a different locality will not be abnormally tame. This opinion is based on several year's experience of rearing ducklings in an investigation especially concerned with the forming of social bonds amongst young birds. But the opposite view is widely held. Butt (1956) says 'I am convinced that the only way (to prevent

adult tameness) is for the birds to see humans as little as possible; the only person who should visit them regularly is the one who feeds them, and he should frighten the life out of them every time he goes near them'. Perhaps the dispassionate detachment of the Dickensian orphanage-master represents the best compromise.

Release

The problems of release consist in when and where. Cornish (1903) said that young Mallards should be transferred to their feral home six weeks after hatching. This suggestion is probably as good as any. Young Mallard first fly somewhere between seven and 12 weeks after hatching, wild birds maturing earlier than those from captive stocks (Foley 1954). In the intensive investigations carried out at Delta, Manitoba, ducklings were released at between five and 12 weeks (Brakhage 1953) and those released before they were able to fly seem to have done better. In the large restocking programme of New York State the age at release was standardised at about five weeks, this having been found to provide the greatest return in terms of money spent (Benson 1939).

In deciding where hand-reared birds should be released the most important requirement is that the place chosen should have not only adequate supplies of food but also plenty of escape cover. This is defined by Foley (*loc. cit.*) as 'emergent cover that is easily negotiated by swimming ducklings.' He found that the composition of this cover seemed to make little difference, so long as it remained negotiable. Butt (*loc. cit.*) reports that his Association chose to release their ducklings at places where wild ducks were already present. This is a very sensible procedure when possible. In districts where no ducks are known to have nested the most suitable localities seem likely to be small marshes or cover-fringed pools with some water that will not dry up during the six weeks after the release. 'Wild' country is not necessary, small ponds or marshy places of as little as an acre in arable areas being able to provide all the necessary requirements. There are no data which suggest either upper or lower limits to the density of stocking, except that ten ducklings per acre seemed no better or worse than one in the New York experiments (Foley *loc. cit.*). Brakhage (*loc. cit.*) notes that at Delta the ducklings were originally released on the marsh without conditioning or protection of any sort and suffered heavy losses before becoming competent flyers. Later the losses were reduced by liberating the birds on a pond enclosed by a predator-proof fence, in the company of pinioned and visiting wild birds. This procedure may not always be possible in Association rearing schemes.

From the point of view of shore-shooters the selection of releasing places must also be influenced by the behaviour of the ducks. British hand-reared Mallard are extraordinarily sedentary. Forty-one of 46 recoveries of hand-reared Mallard marked at places within two miles of the coast were obtained 'where ringed'. But 592 recoveries of hand-reared Mallard released at places farther inland have included only two from the coast. The ringing stations involved have been spread over 11 counties, but none has been more than 15 miles from the shore. Clearly, if wildfowling are to benefit from the Mallard they rear, the birds must be liberated very close to the place where it is intended that they should be shot.

The results of early American releasing experiments (Lincoln 1934, Pirnie 1935, Errington and Albert 1936) also showed that hand-reared ducks did

not disperse like wild ones. But the more recent experiments (Brakhage *loc. cit.*, Foley *loc. cit.*, Wells 1952), in which most of the birds used were reared from wild-taken eggs, have shown that normal dispersal may occur, apparently as the result of the young birds accompanying wild adults or juveniles on their autumn migrations (see also Hochbaum 1955). Many, probably most, British-breeding Mallard do not migrate, so that hand-reared ones released in Britain would scarcely be expected to move long distances, except as abmigrants (as the result of pairing in winter with birds visiting this country but breeding in Scandinavia or Russia).

This reference to migratory behaviour is not so much of a 'red herring' as it might seem, for it becomes of importance when the question of using other species for restocking is considered. Pintail, Shoveler and Wigeon may be suggested for the purpose, since all breed fairly widely in Britain (in some places possibly as the result of earlier introductions). All are much more likely to reach the coast than inland-bred Mallard. But all are likely to be seduced by foreign visitors.

Replacement

The discussion of replacement may well be based on a text by Brakhage (*loc. cit.*), 'it cannot be considered sound management to stock birds which do not survive long enough to reproduce'. Most rearing programmes have proved unsatisfactory in this respect. In the first place pre-fledging losses amongst hand-reared young are substantially greater than the losses suffered by ducks in the wild. For example, in New York State losses of hand-reared Mallard between release at five weeks old and attaining flying age probably amounted to 310 of the 801 released (39%) (Foley *loc. cit.*), whereas losses of wild Mallards during the same stage in the life cycle (as determined from brood counts by several workers) are probably less than 2% (Hickey 1952). Indeed, these losses between release and flying are of the same order as the total losses between hatching and fledging amongst wild broods.

Second, the mortality *after* fledging is consistently higher for hand-reared than for wild-trapped ducks. From nearly 2000 recoveries of British-ringed Mallard I find the mortality of hand-reared birds (over 700 recoveries used) in the first year after fledging to have been 94%, compared with 71% for wild juveniles and 70% for those marked in Holland, from data given by Eygenraam, 1955. (Höhn (1948) reported both to suffer losses of about 89%, but his sample of wild juveniles was unsatisfactory; many more have been ringed since he examined the recovery data.) From ringing in North America in the years 1924-39 Hickey (*loc. cit.*) computed the first year losses of hand-reared and wild Mallard at 82% and 68% respectively. Brakhage (*loc. cit.*) reports losses of 91% of hand-reared and 70% wild-trapped. Darrow (1949) put the first year mortality of hand-reared Mallard in New York at 80%. Similarly the rates for Pintail in Manitoba were 89% for hand-reared and 66% for wild-trapped (Brakhage *loc. cit.*). It has also been found that the rates of loss in years after the first tend to be higher for hand-reared birds than for wild ones, for which the mortality rate is of the order of 50%. Because of the large clutches laid by the Mallard and the persistence it shows in re-nesting, it is possible for the species to maintain its numbers even with a first-year death-rate of 70%. But when losses during the same period are over 80% the task is too great and the population must decline unless continually added to artificially. This has been the case with all but one of the hand-reared stocks in Britain for which

information is available as the result of ringing. The exception is the population started at Slimbridge in 1948. With an ample food supply and no shooting this group has approached immortality (by ornithic standards).

To recapitulate, the release of hand-reared Mallard seems unlikely to benefit coastal wildfowlers or to increase the British population in the long run. Releasing programmes can improve shooting on inland waters (and have often been used for this purpose), but the ducks are unlikely to frequent the coasts in numbers sufficient to improve the sport of shore-shooters. Releases will increase the British population only if these hand-reared ducks are afforded some special protection to offset their unusual vulnerability to the hazards of free-living. The use of other species might give better results, but it will be difficult to obtain sufficiently large supplies of their eggs.

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