

Most occur between October and February (in Ireland) and in July (in Greenland).

The White-front population breeds along the west coast of Greenland from about 64° N. to 72° 30' N. Ringing has been done in sixteen places widely scattered over the breeding range. Recoveries show that the geese breeding north of 69° N. concentrate in winter in Co. Wexford, while those breeding farther south are scattered widely in Ireland. The northern breeding population is apparently increasing, but the existing data are insufficient to show whether this is due to smaller adult losses than those suffered by the southern breeding birds or to greater breeding success. Continued ringing should solve this problem.



Tufted drake

## WILDFOWL COUNTS 1956-57

### Fluctuations in the Winter Population of Tufted Ducks in Great Britain—A Summary

by G. L. Atkinson-Willes

*The Fourth Report on National Wildfowl Counts, published by the Trust in December 1957, was devoted to a study of the numbers of Tufted Ducks found in winter in Great Britain. We reprint here the summary of that paper. The full report, issued free to all participants in the Count Scheme, is available from the Trust at 2s. 6d.*

ONE of the main difficulties in assessing trends in the populations of any species by means of wildfowl counts is that continuous records over periods of sufficient length are available from only a small proportion of the waters now counted. In the case of the Tufted Duck (*Aythya fuligula*), however, it can be shown that the small samples of records available for long periods give much the same

picture, in the years to which they are common, as the much larger samples available in more recent years.

Five samples of comparative counts have been assembled, varying in size and length from one of 165 waters for the six years, 1950-51 to 1955-56, to one of 601 waters for the single season 1955-56. The patterns of the seasonal fluctuations in the numbers of Tufted Ducks (*Aythya fuligula*) presented by the five samples are first compared and shown to be similar in the years for which they are all available. From this it is inferred that the smaller samples are as reliable as the larger ones.

The trends in population are also examined by this method with the larger samples being used to confirm the results of the longer but smaller ones. During the period 1950-51 to 1955-56 wide variations in the numbers present in October, November, February and March may be detected, with increases in the level of population in these months in 1955-56 and to a lesser extent in 1954-55. In January, however, which is the month in which the population of Tufted is most likely to be stable, no variation between the levels in the six years is detectable. From this it is inferred that although early and late in the season the British wintering population of Tufted may be augmented by varying numbers of immigrants, the basic population in January, after the arrival of the autumn immigrants and prior to the hard-weather influxes, has been constant throughout the six years under review.

Examination of relative numbers of Tufted Duck counted in different areas and on different habitats reveals a variety of population patterns. In particular, reservoirs appear to be of great importance, as although they comprise only 20% of the waters counted, they carry up to 60% of the birds recorded throughout most of the winter. As a great deal of information on the size and depth of reservoirs is already available, it is intended that the behaviour of the populations of Tufted on them shall be the subject of a further, more detailed, paper.

## THE PLACE OF AERIAL SURVEYS IN BRITISH WILDFOWL RESEARCH

### **The Alternative Methods of Population Study**

A BASIC requirement for programmes of conservation is a knowledge of the size and distribution of the animal populations concerned. The capture/recapture technique can estimate population size, but a general knowledge of distribution is implicit in the sampling process. Moreover, it is necessary to use traps which are mobile (or used in large numbers throughout the country) and which do not result in trap-shyness developing. Neither of the usual duck-catching devices, decoys and cage-traps, meet these requirements. Only Shelducks congregate in suitable numbers to be driven into stake-nets when flightless in the moult. Most ducks only form dense flocks on water or mud banks, where rocket-propelled nets cannot be used.

The majority of duck populations and some of the geese can therefore only be studied by direct survey methods. In some cases where the population is relatively small and restricted, a complete census can be the aim. Generally, only the population found in sample areas can be surveyed. But if this sample